

PRELIMINARY

TC-651

General Export Model



Set using ISO screws

SPECIFICATIONS

Power Requirements:	AC 100V, 110V, 117V, 120V, 125V, 220V and 240V (Changeable by using the voltage selector) 50/60 Hz, 85W	Two LINE INPUTS Impedance : 100 kΩ Maximum sensitivity : 70 mV (-22 dB)									
Track System:	Four-track stereo and mono	REC/PB connector Impedance : 80 kΩ Maximum sensitivity : 30.5 mV (-28 dB)									
Reel Size:	7" maximum	Outputs: Two LINE OUTPUTS Impedance : 100 kΩ Output level : 0.775V (0 dB)									
Tape Speed:	7½ ips and 3½ ips (19 cm/s and 9.5 cm/s)	REC/PB connector Impedance : 100 kΩ Output level : 0.775V (0 dB)									
Recording Time: (with 1,800 ft. tape)	<table><thead><tr><th>Tape speed</th><th>4-track stereo</th><th>4-track mono</th></tr></thead><tbody><tr><td>7½ ips (19 cm/s)</td><td>1.5 hrs</td><td>3 hrs</td></tr><tr><td>3½ ips (9.5 cm/s)</td><td>3 hrs</td><td>6 hrs</td></tr></tbody></table>	Tape speed	4-track stereo	4-track mono	7½ ips (19 cm/s)	1.5 hrs	3 hrs	3½ ips (9.5 cm/s)	3 hrs	6 hrs	HEADPHONE output Impedance : 8Ω load Output level : 0.038V (-26 dB) with 8Ω load (when line output level is 0 dB.)
Tape speed	4-track stereo	4-track mono									
7½ ips (19 cm/s)	1.5 hrs	3 hrs									
3½ ips (9.5 cm/s)	3 hrs	6 hrs									
Frequency Response: (with standard tape)	20 ~ 25,000 Hz at 7½ ips (19 cm/s) 30 ~ 18,000 Hz at 3½ ips (9.5 cm/s)	Semiconductors: 74 transistors and 92 diodes									
Signal-to-Noise Ratio: (with standard tape)	54 dB	Dimensions: 16½ (W) x 18 (H) x 9½ (D) (422 x 457 x 243 mm)									
Flutter and Wow:	0.04% at 7½ ips (19 cm/s) 0.08% at 3½ ips (9.5 cm/s)	Weight: 44 lb 8 oz (20.2kg)									
Recording Bias Frequency:	Approx. 120 kHz										
Inputs:	Two MIC inputs Impedance : 600Ω Maximum sensitivity : 0.2 mV (-72 dB)										

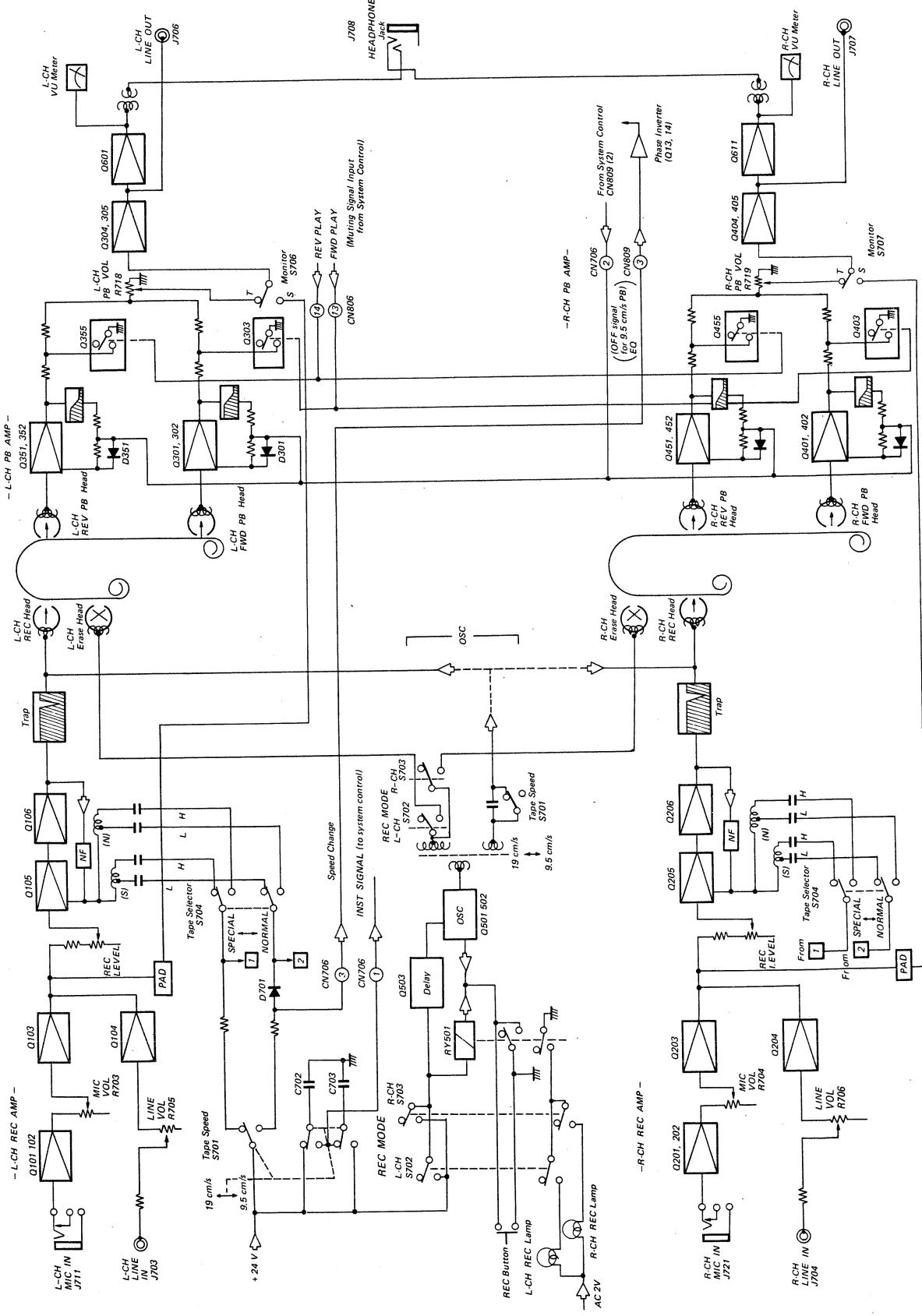
SONY®
SERVICE MANUAL

TABLE OF CONTENTS

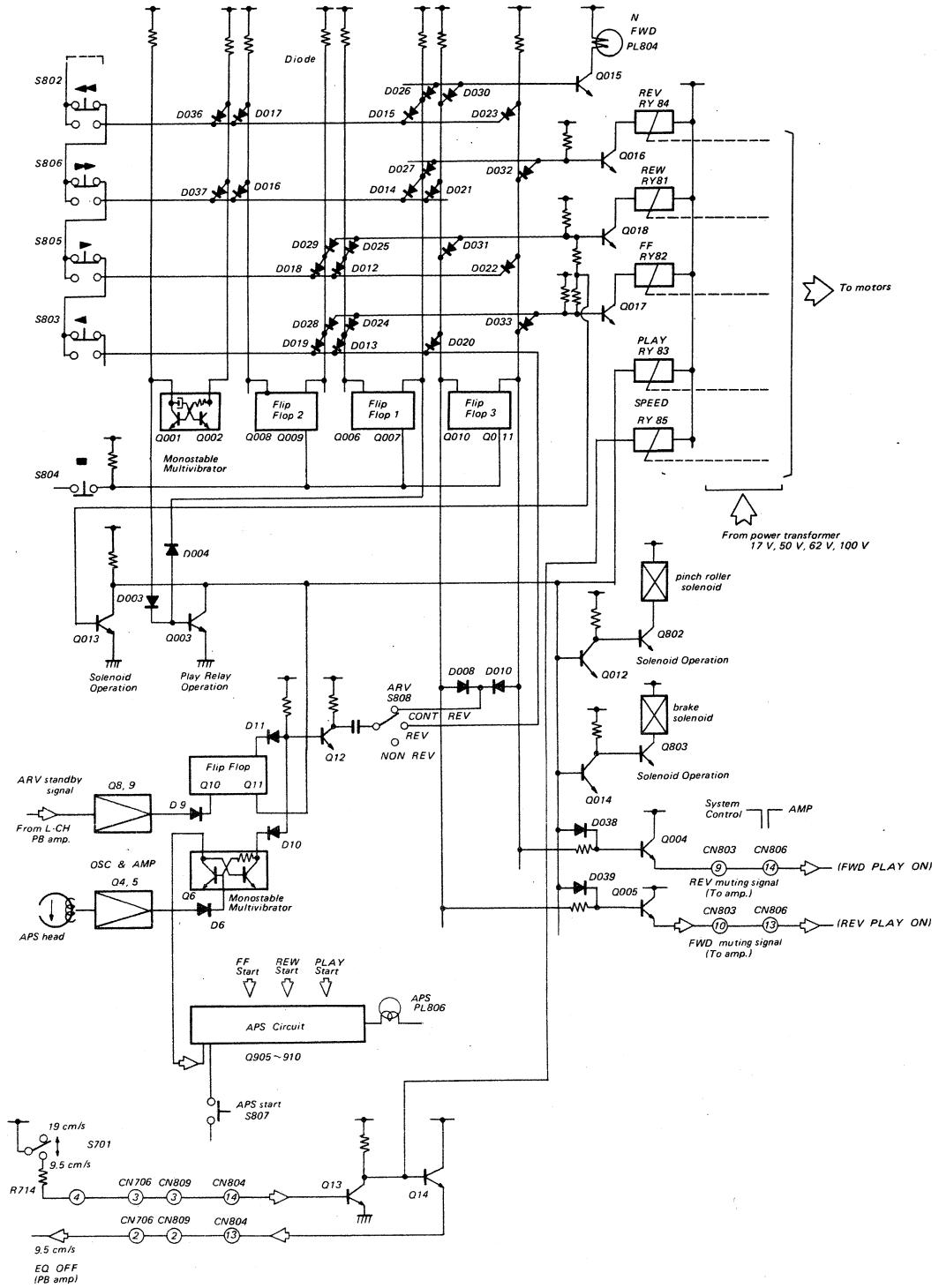
<u>Title</u>	<u>Page</u>	<u>Title</u>	<u>Page</u>
SPECIFICATIONS	1		
1. BLOCK DIAGRAMS			
1-1. Audio Amp. & Bias OSC Circuit	3	6-3. Playback Amplifier Circuit Board	16 ~ 17
1-2. System Control Circuit	4	6-4. BIAS OSC Circuit Board	18 ~ 19
2. MAJOR PARTS LOCATIONS		6-5. Headphone Amplifier Circuit Board	20 ~ 21
2-1. Cabinet Front View	5	6-6. System Control Circuit Board (1)	22 ~ 23
2-2. Cabinet Side Views	5	6-7. System Control Circuit Board (2)	24 ~ 25
2-3. Chassis Top View	6	6-8. System Control Circuit Board (3)	26 ~ 27
2-4. Chassis Bottom View	6	6-9. APS Circuit Board	28 ~ 29
3. DISASSEMBLY		6-10. Resistor Terminal Circuit Board	30
3-1. Cabinet Removal	7	6-11. ARV Switch Circuit Board	30
3-2. Printed Circuit Board Removal	7	7. ELECTRICAL PARTS LIST	31 ~ 38
4. LEVEL DIAGRAMS		8. EXPLODED VIEWS	
4-1. Playback	8	8-1. Cabinet – top view –	39 ~ 40
4-2. Record	8	8-2. Chassis – top view –	41 ~ 42
5. SCHEMATIC DIAGRAMS		8-3. Head Deck – top view –	43
5-1. Audio Amp. & Bias OSC Circuit	9 ~ 10	8-4. Microswitches View	44
5-2. System Control Circuit	11 ~ 12	8-5. Chassis – bottom view –	45 ~ 46
6. MOUNTING DIAGRAMS		8-6. Amp. Sub-Panel – top view –	47 ~ 48
6-1. REC MODE & SPEED Switch Circuit Board	13	8-7. Amp. Chassis Panel – top view –	49 ~ 50
6-2. Record Amplifier Circuit Board	14 ~ 15	8-8. Flywheel – top view –	51
		8-9. System Control Circuit Boards View	52
		8-10. Packing	53

1. BLOCK DIAGRAMS

1-1. Audio Amp. & Bias OSC Circuit

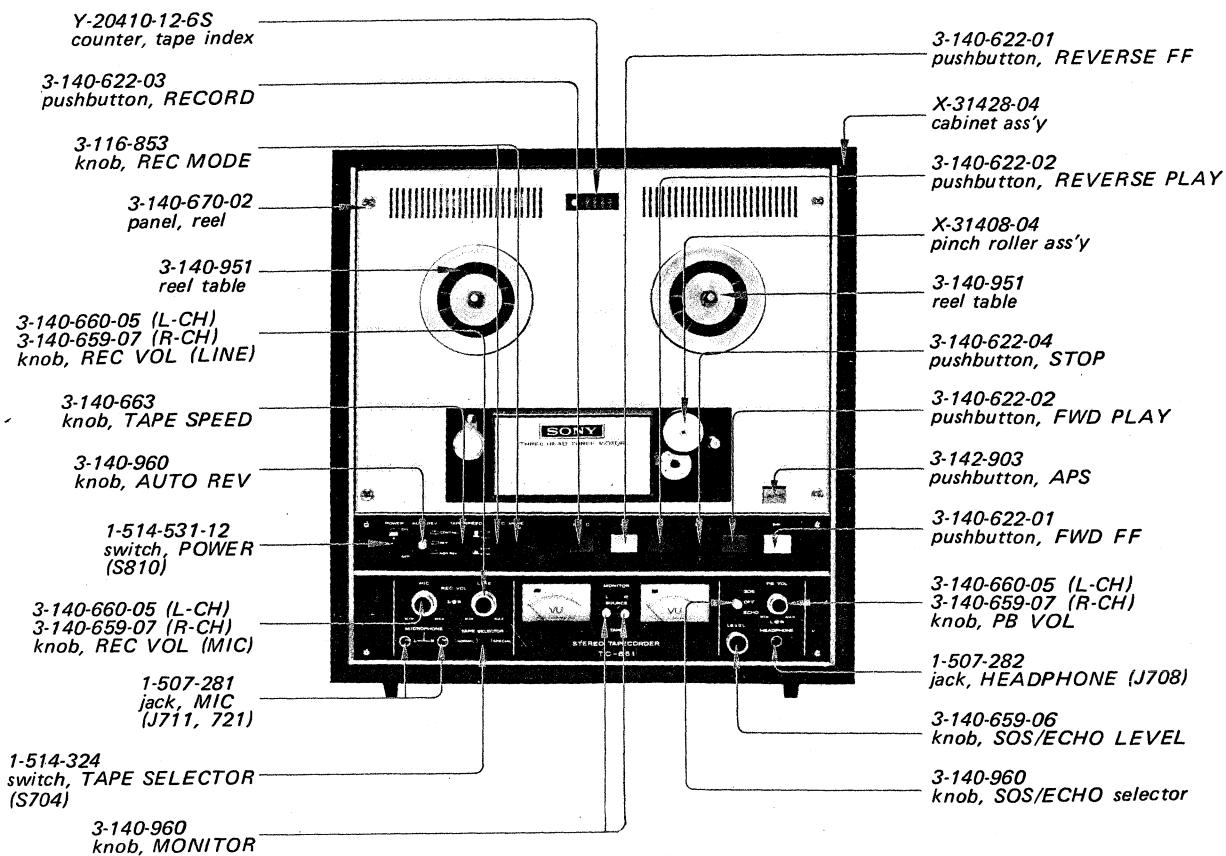


1-2. System Control Circuit

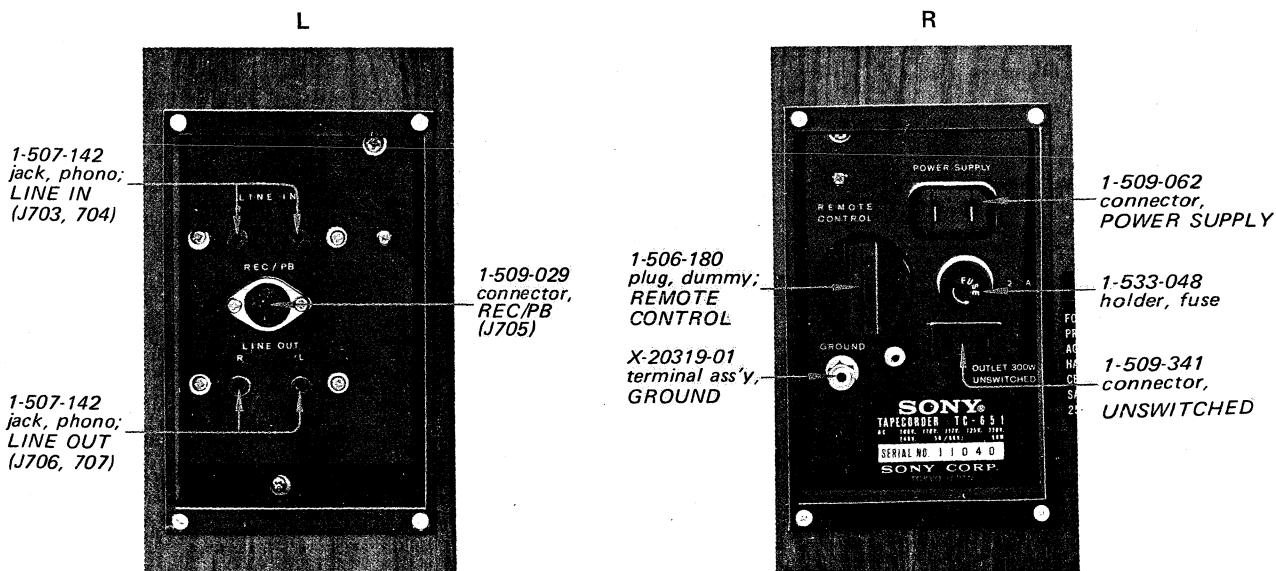


2. MAJOR PARTS LOCATIONS

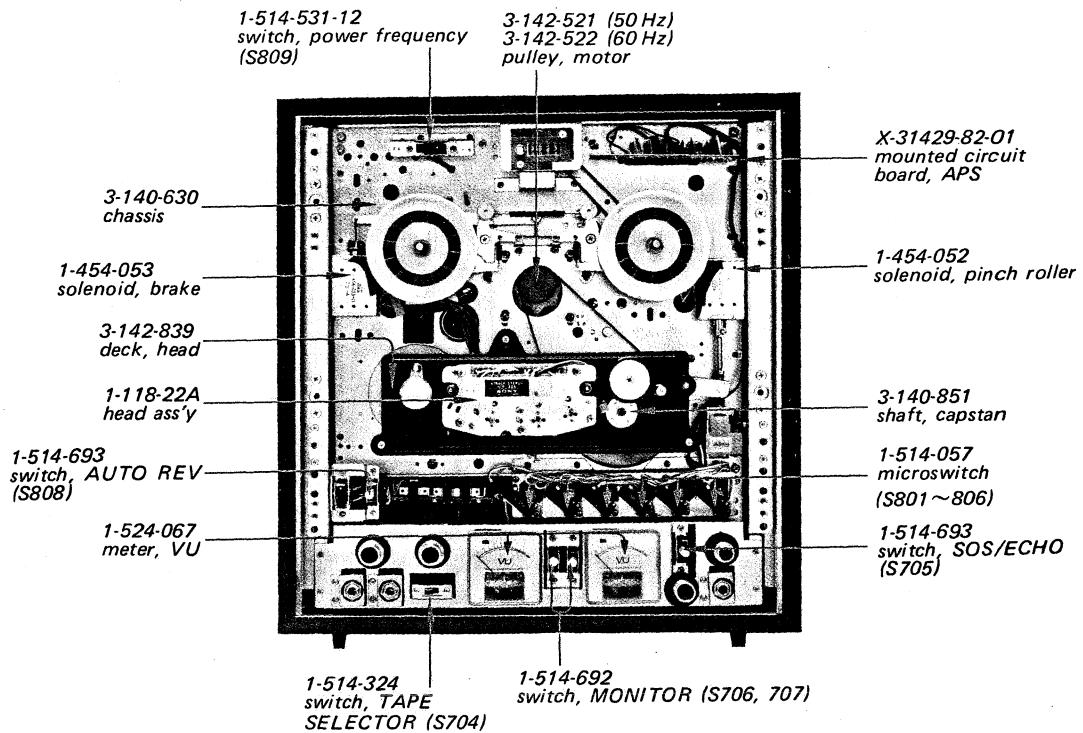
2-1. Cabinet Front View



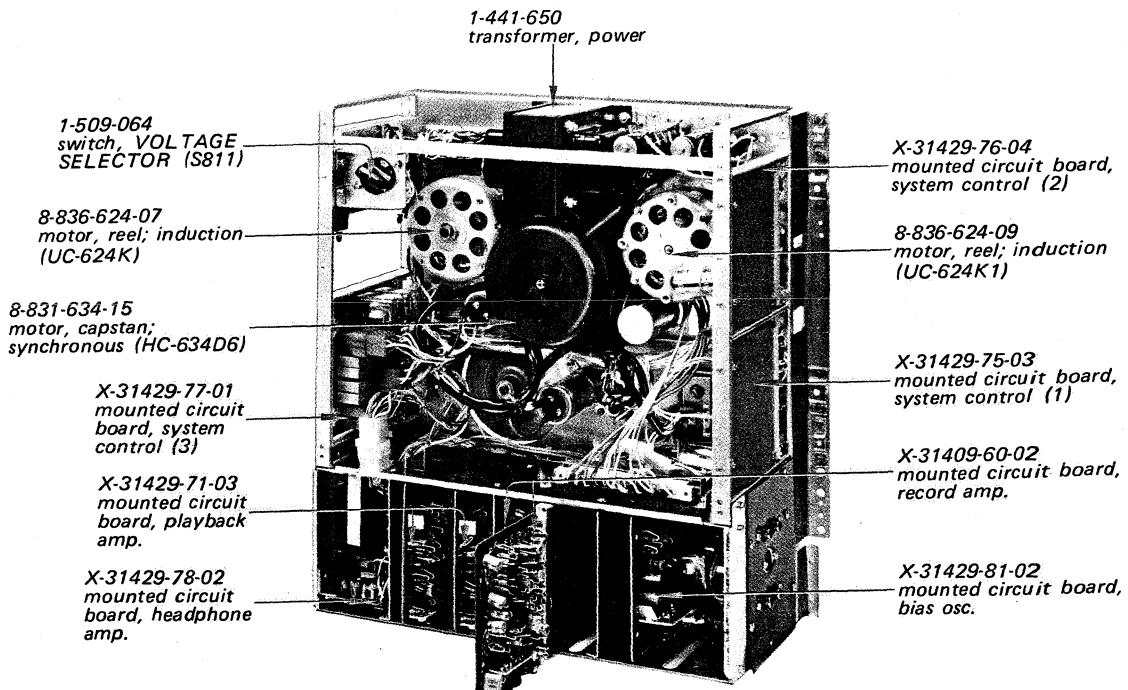
2-2. Cabinet Side Views



2-3. Chassis Top View



2-4. Chassis Bottom View



3. DISASSEMBLY

3-1. Cabinet Removal

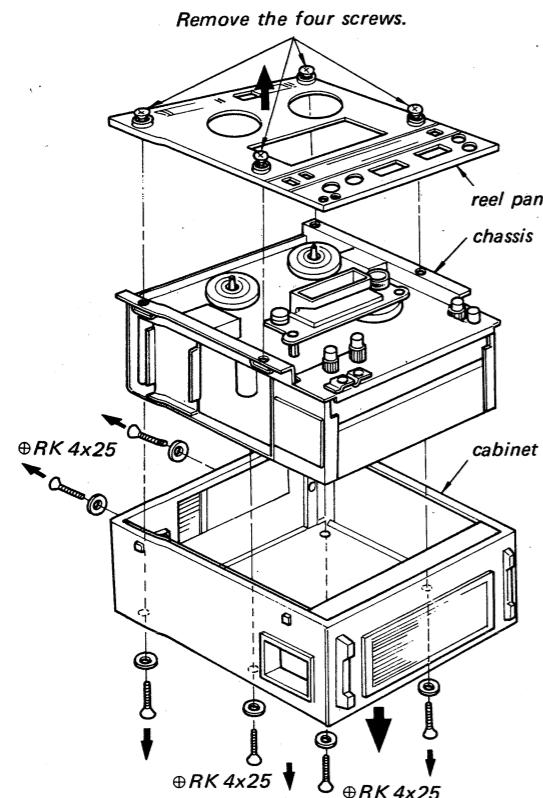


Fig. 3-1. Cabinet removal

3-2. Printed Circuit Board Removal

1. Remove the Cabinet.
2. Pull off the printed circuit boards, PB AMP, REC AMP and BIAS OSC.

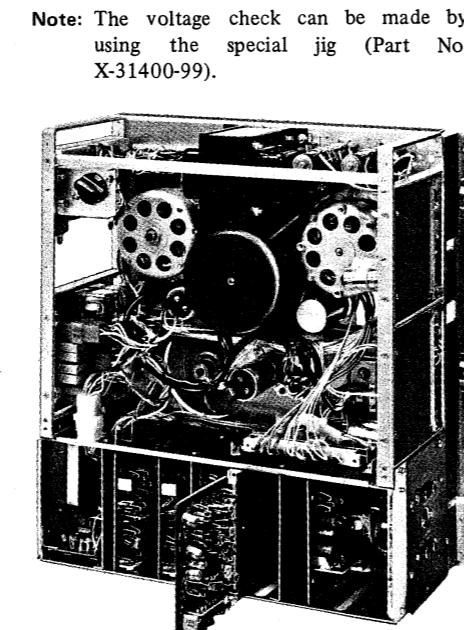
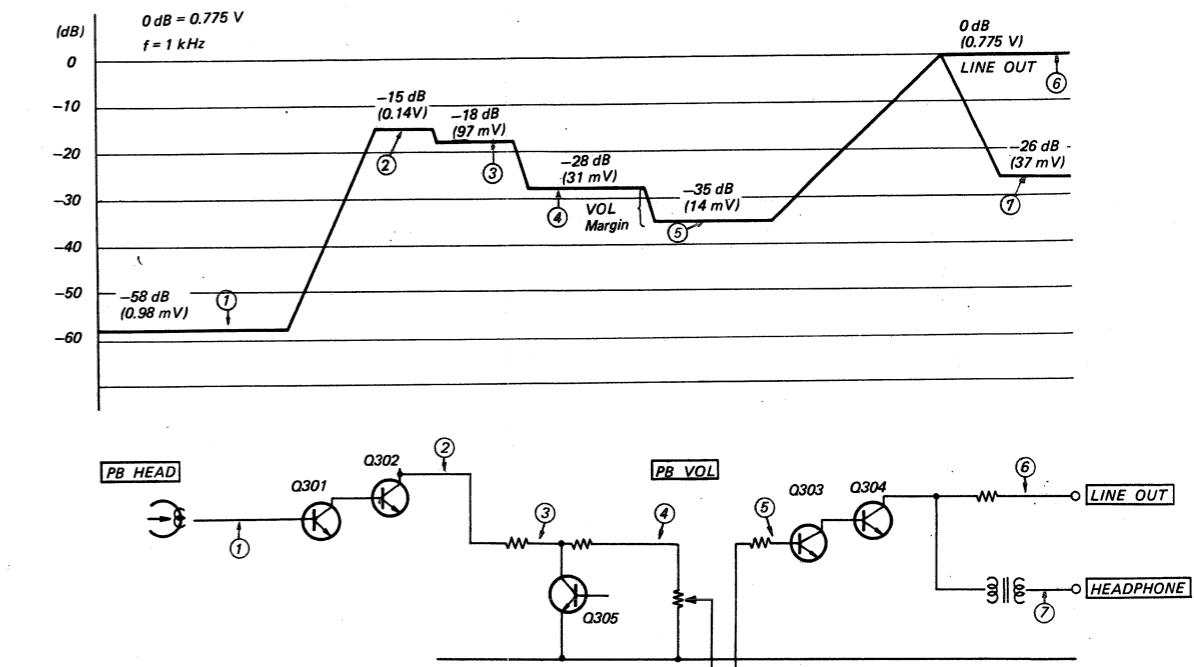


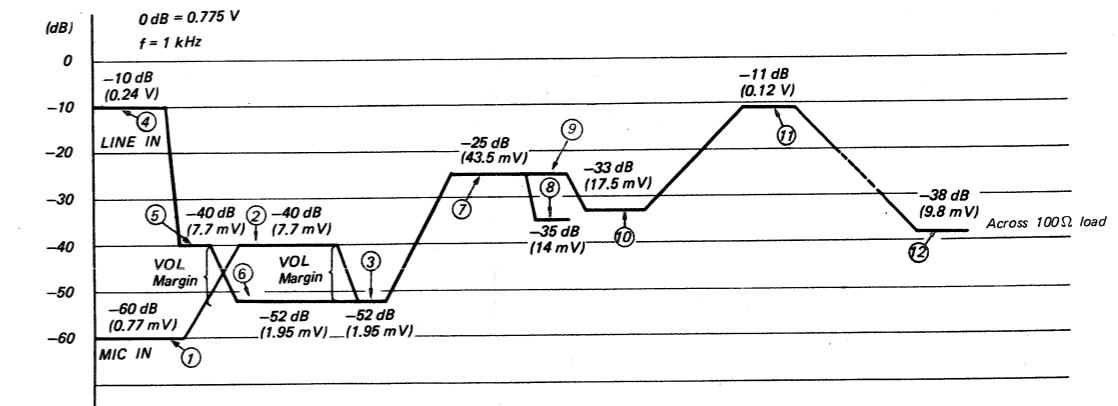
Fig. 3-2. Printed circuit board removal

4. LEVEL DIAGRAMS

4-1. Playback

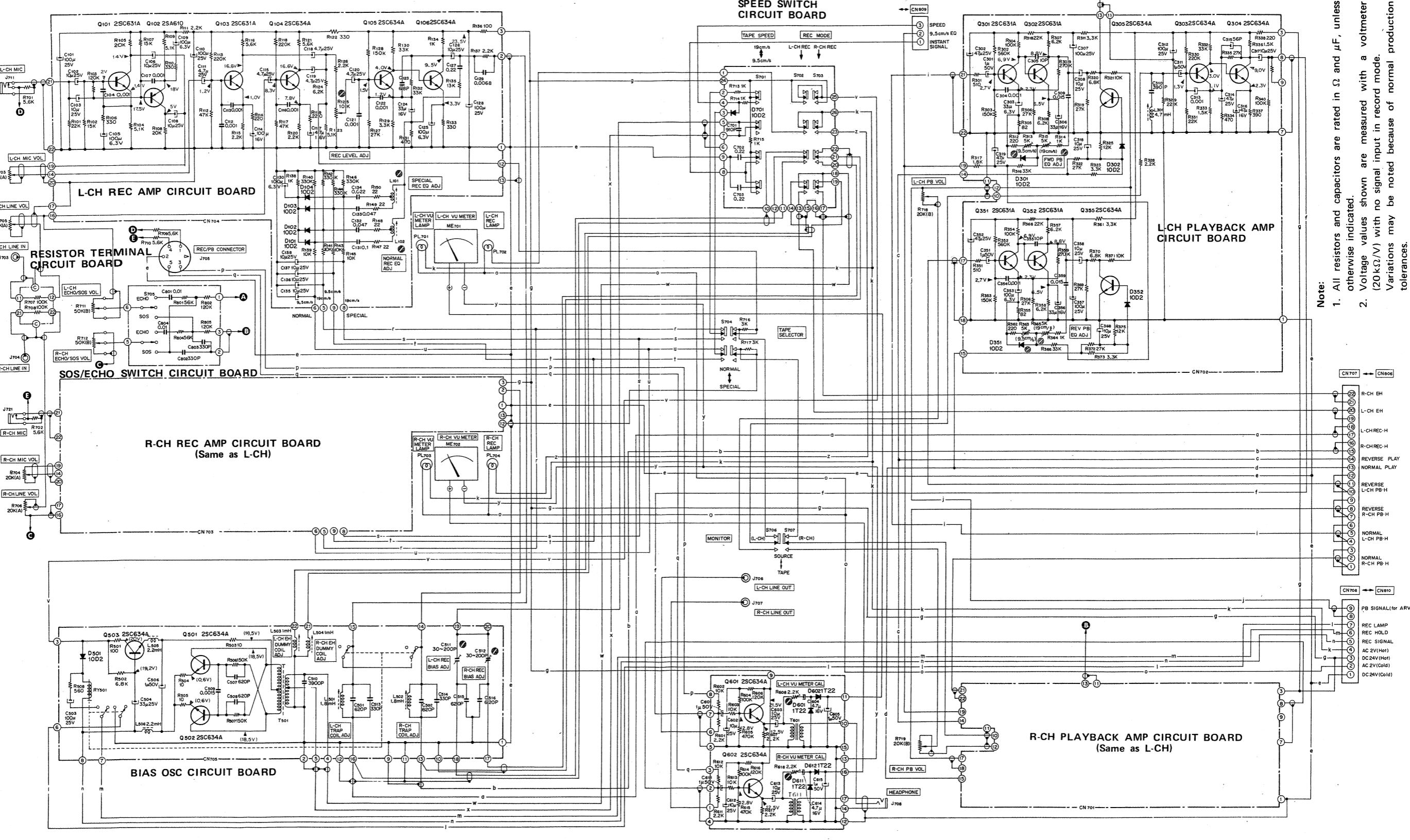


4-2. Record



5. SCHEMATIC DIAGRAMS

5-1. Audio Amp. & Bias OSC Circuit

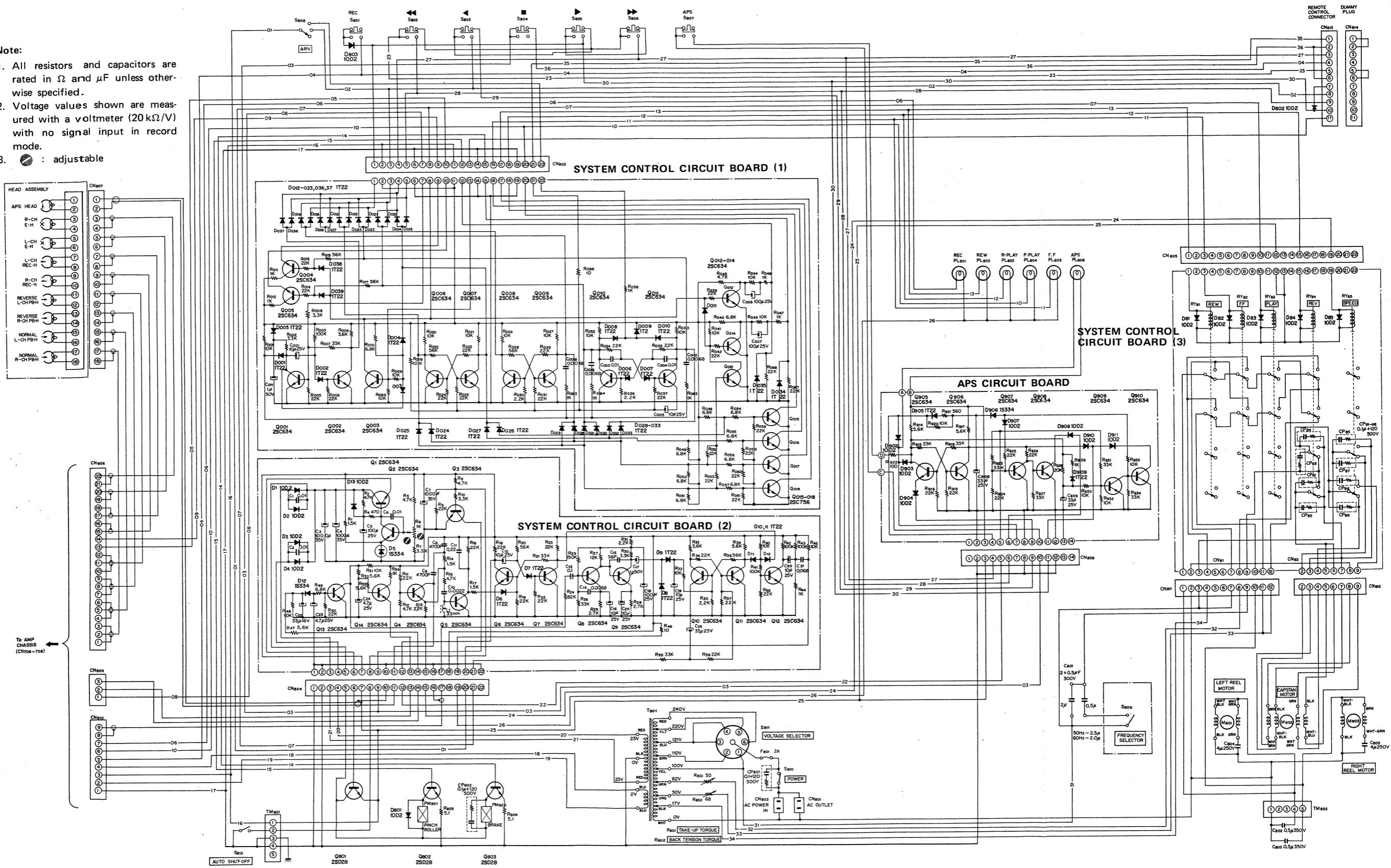


TC-651 **TC-651**

5-2. System Control Circuit

Note:

1. All resistors and capacitors are rated in Ω and μF unless otherwise specified.
2. Voltage values shown are measured with a voltmeter (20 k Ω /V) with no signal input in record mode.
3.  : adjustable

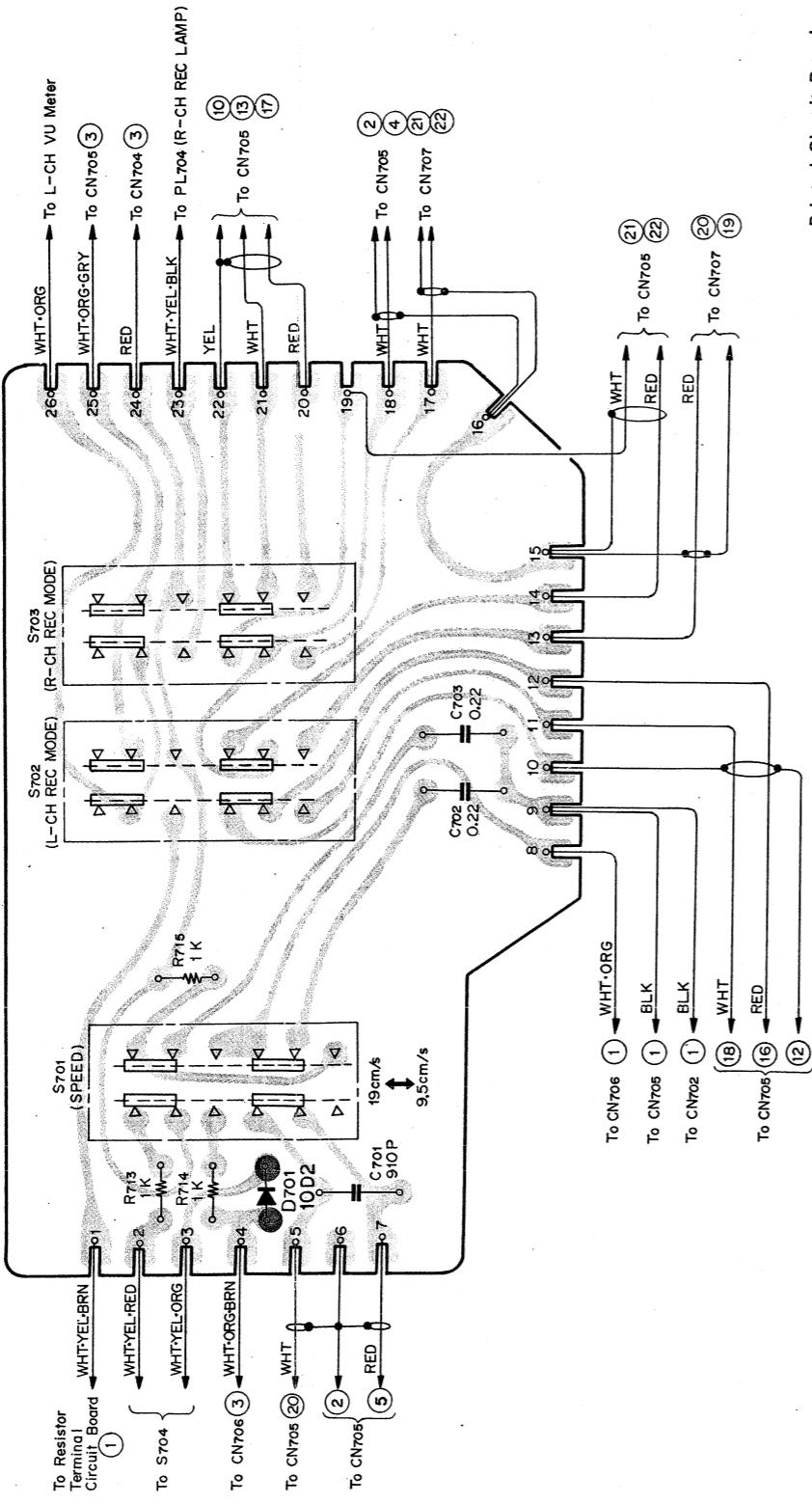


TC-651 **TC-651**

6. MOUNTING DIAGRAMS

6-1. REC MODE & SPEED Switch Circuit Board

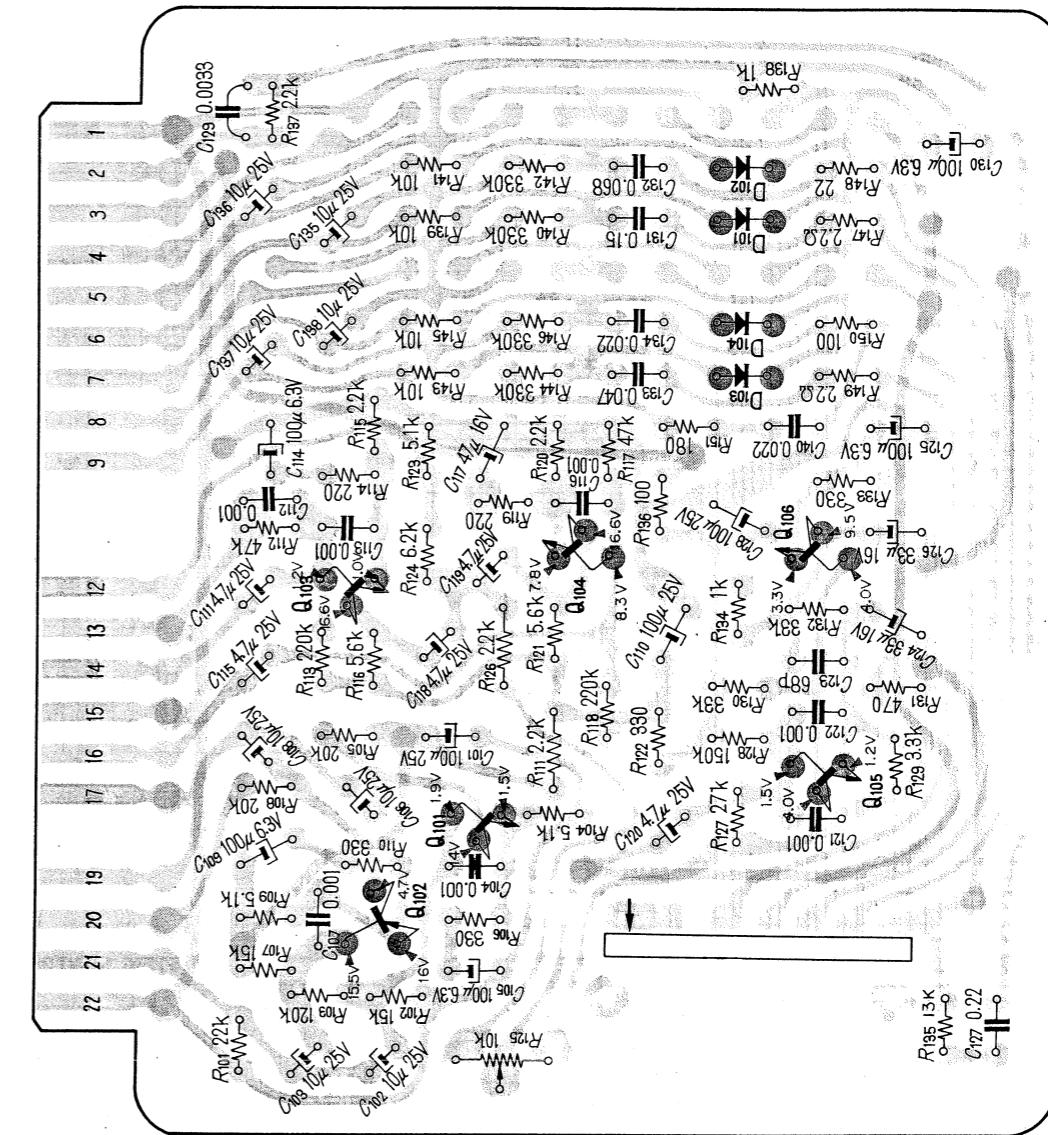
— Conductor Side —



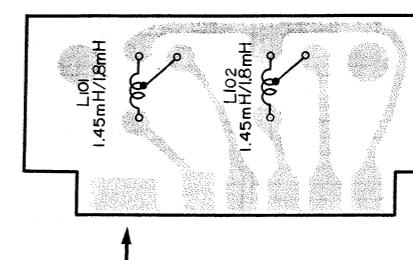
Printed Circuit Board
Part No. 1-539-565-11

6-2. Record Amplifier Circuit Board

– *Conductor Side* –



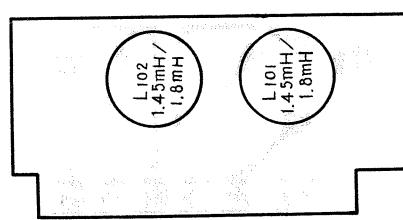
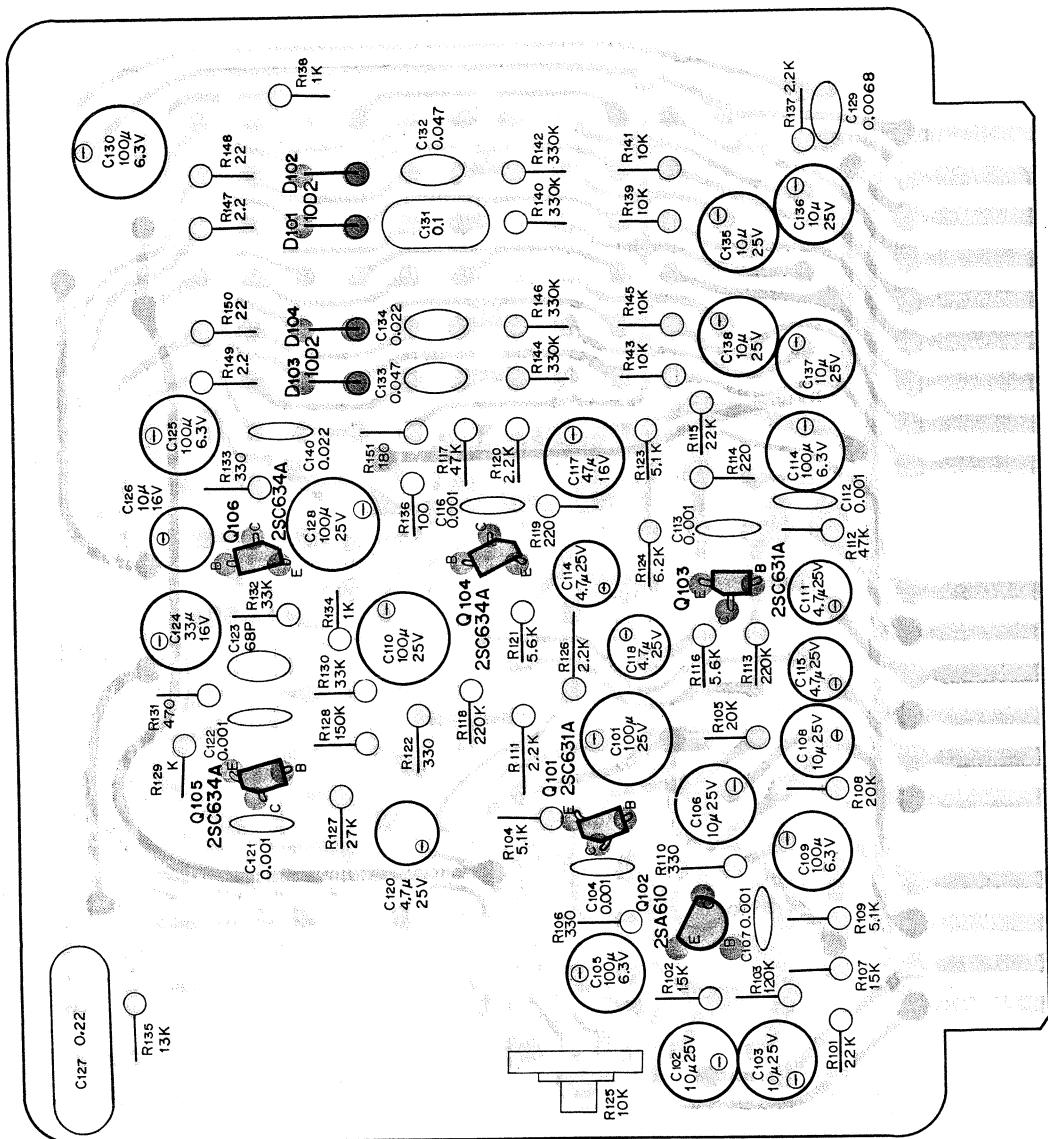
Printed Circuit Board
Part No.: 1-539-432-12



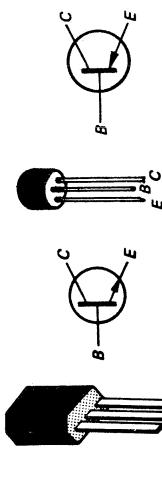
Printed Circuit Board
Part No. 1-539-431-14

6-2. Record Amplifier Circuit Board

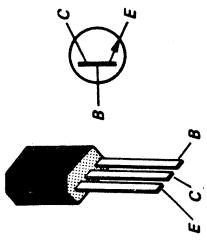
- Component Side -



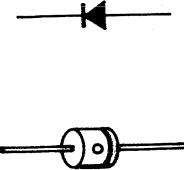
2SA610



2SC631A, 2SC634A

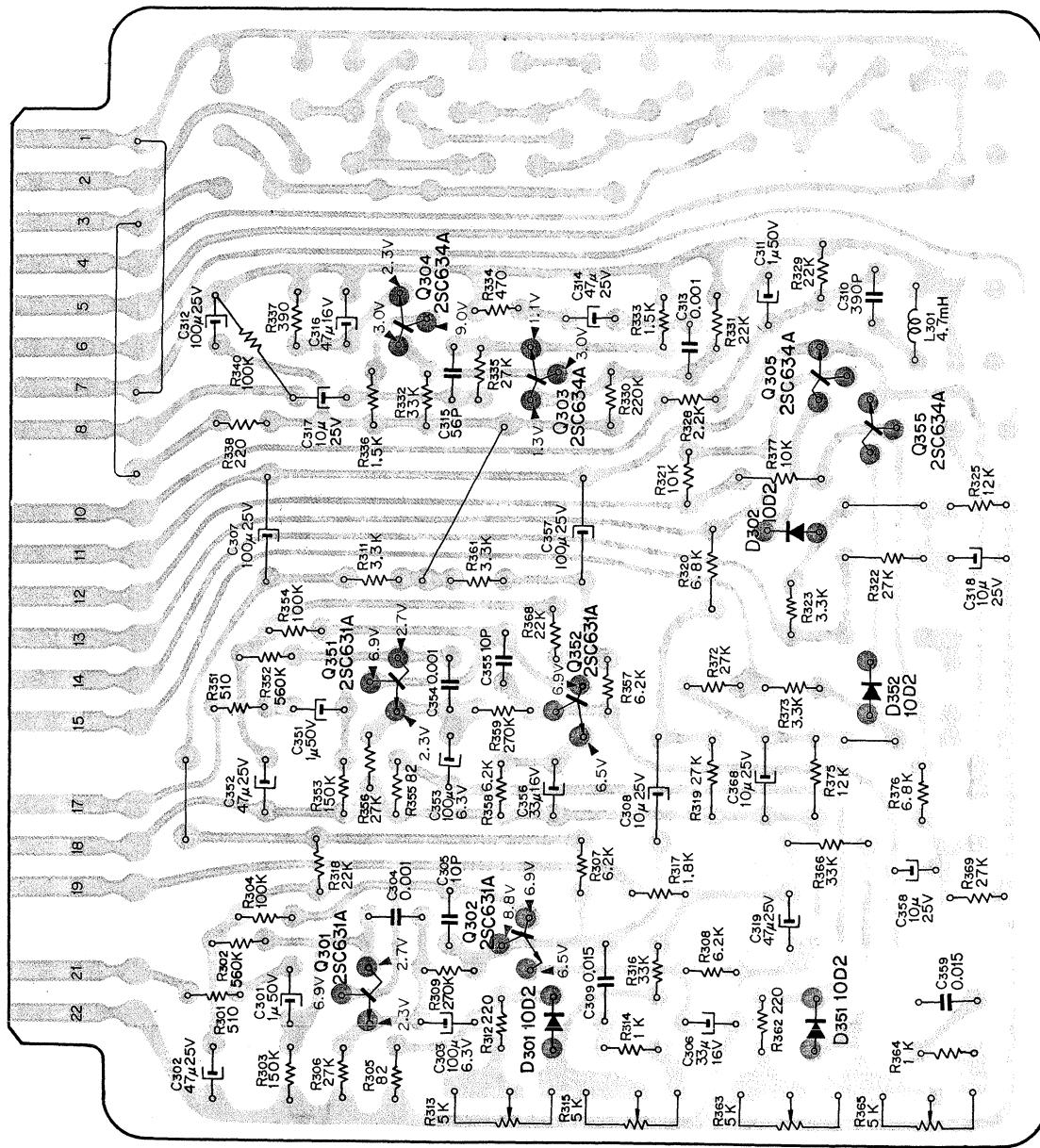


10D2



6-3. Playback Amplifier Circuit Board

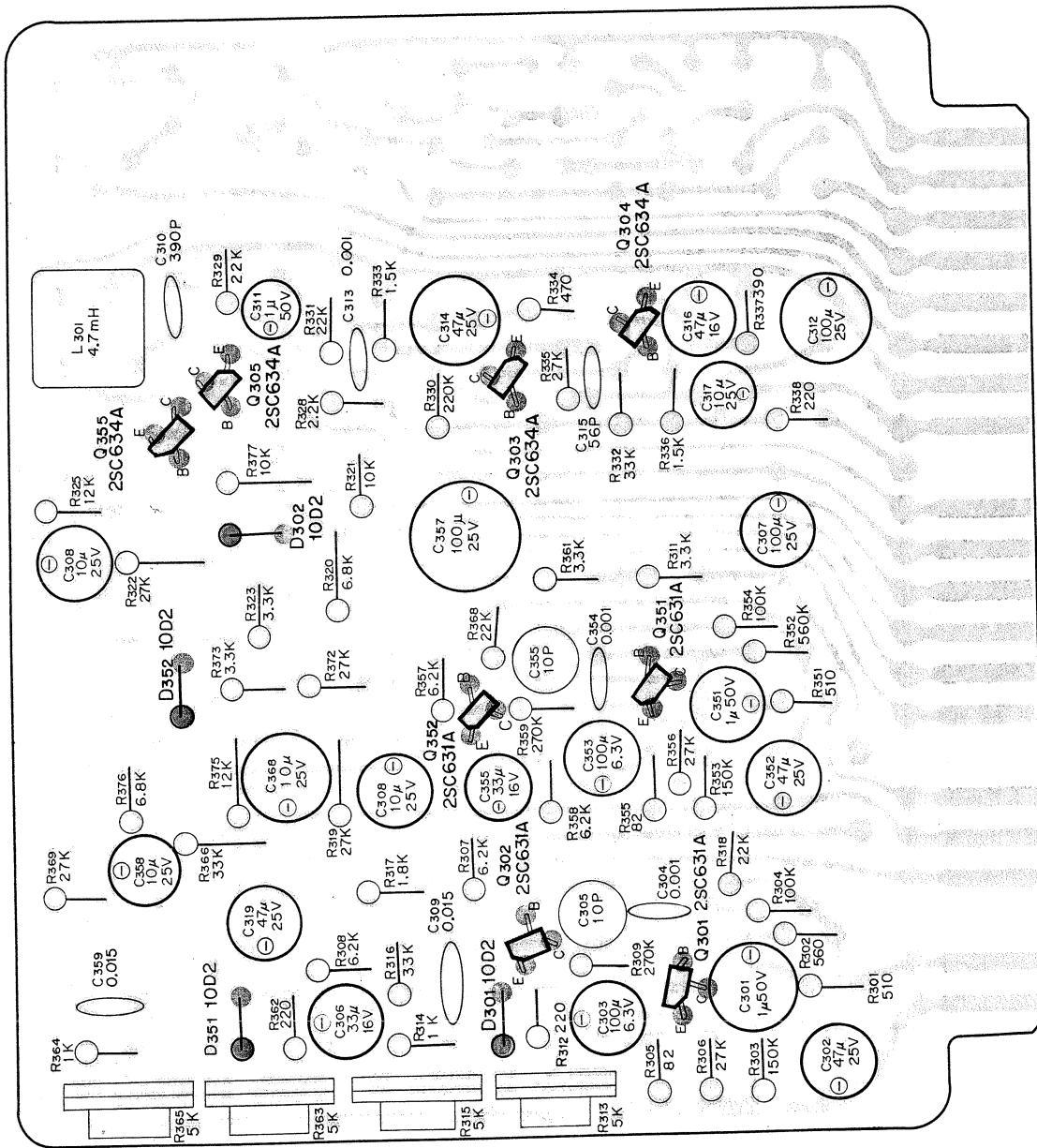
- Conductor Side -



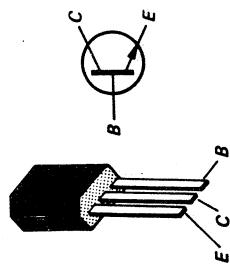
Printed Circuit Board
Part No. 1-539-641-11

6-3. Playback Amplifier Circuit Board

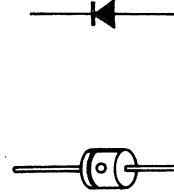
- Component Side -



2SC631A. 2SC634A

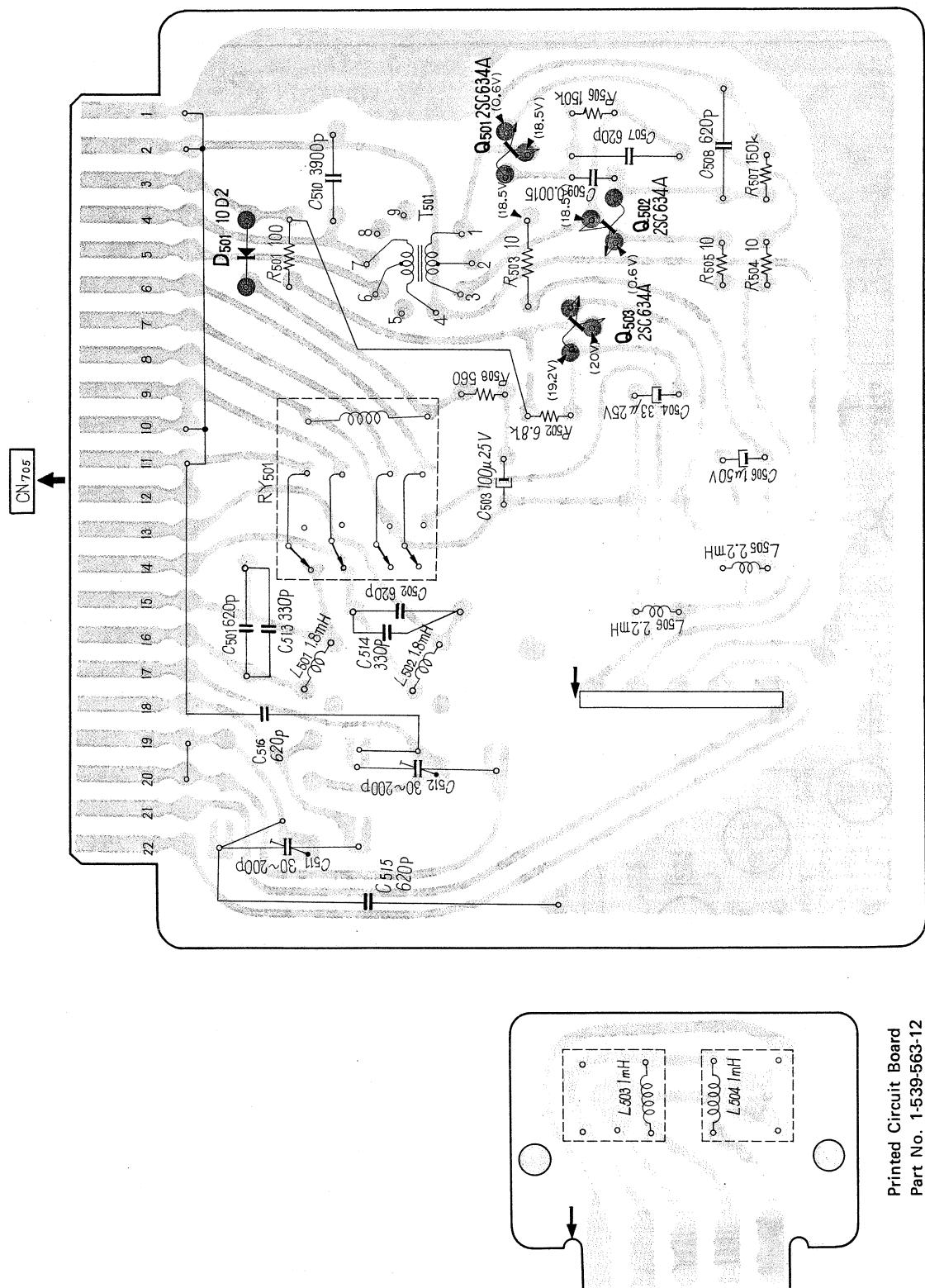


10D2



6-4. BIAS OSC Circuit Board

- Conductor Side -

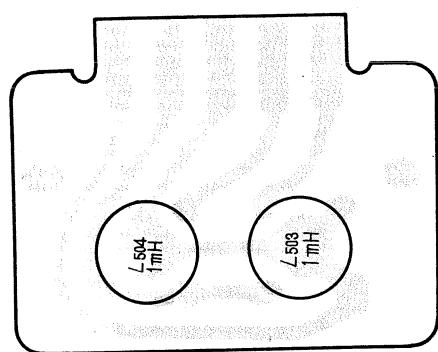
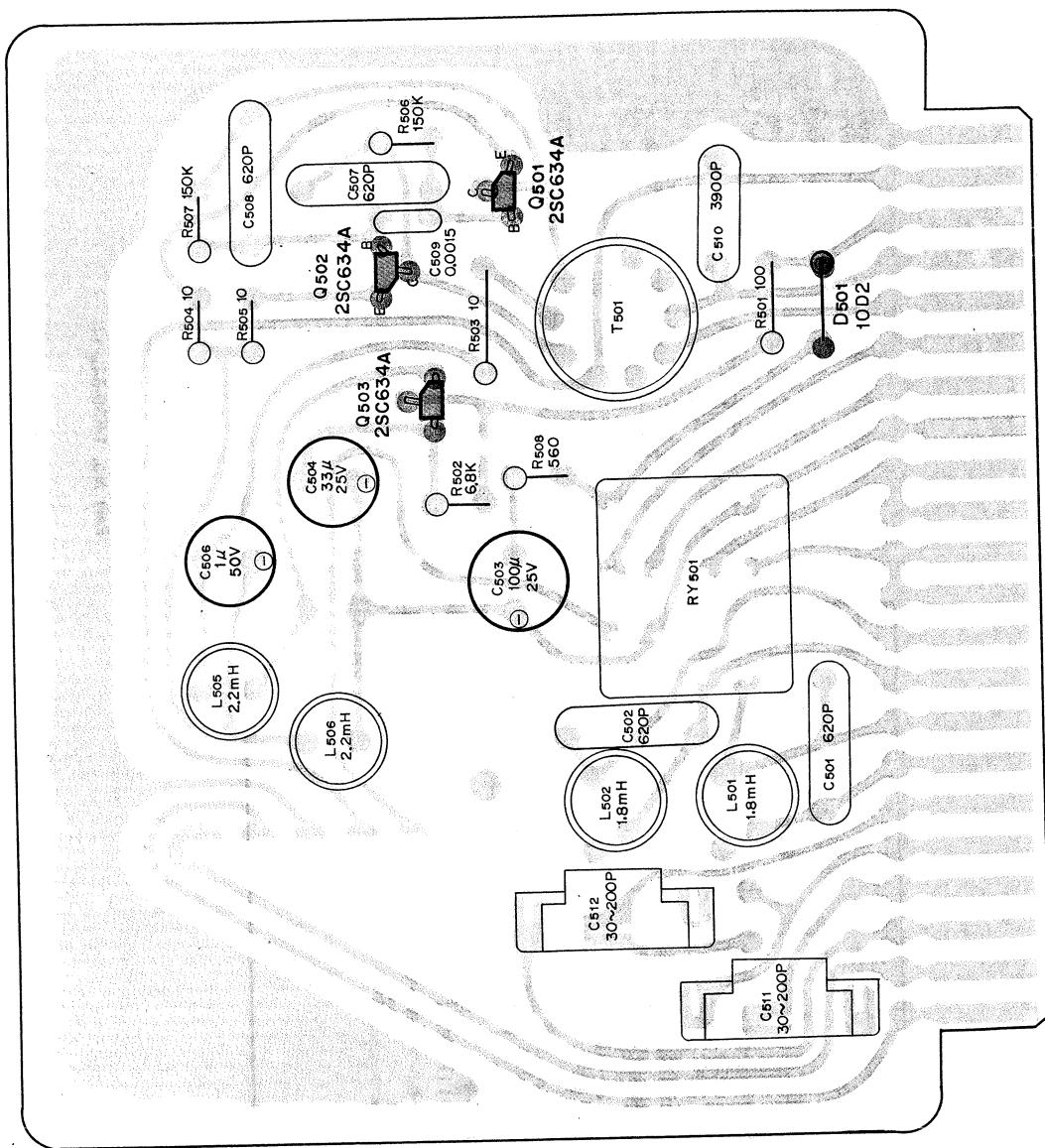


Printed Circuit Board
Part No. 1-539-563-12

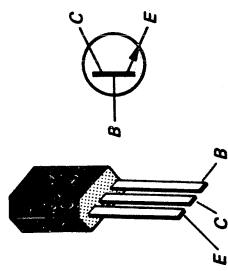
Printed Circuit Board
Part No. 1-539-558-12

6-4. BIAS OSC Circuit Board

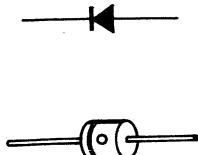
— Component Side —



2SC634A

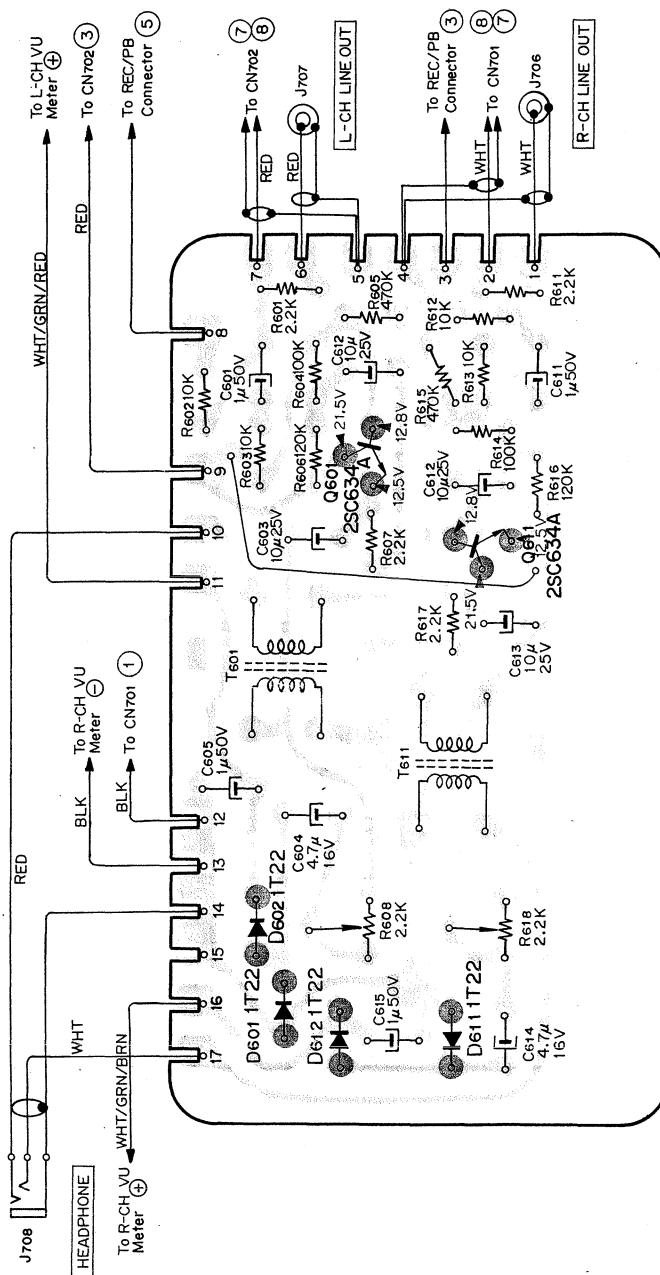


10D2



6-5. Headphone Amplifier Circuit Board

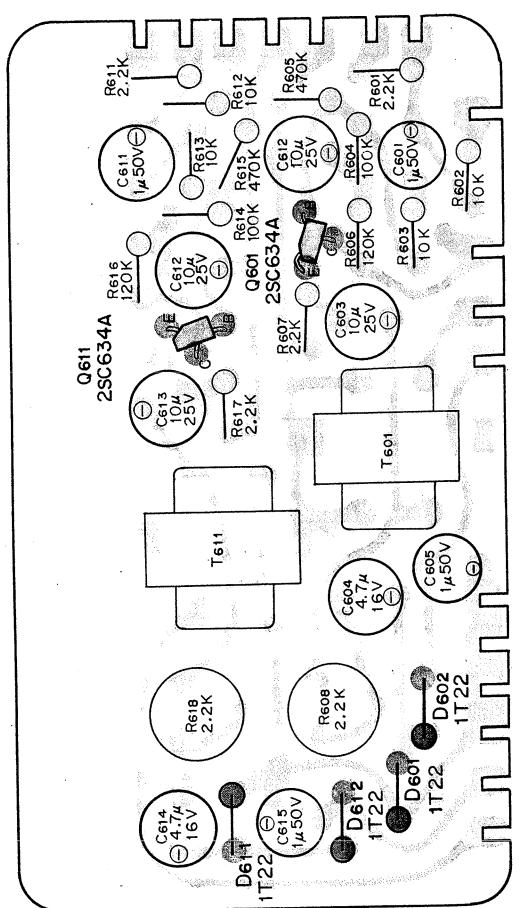
- Conductor Side -



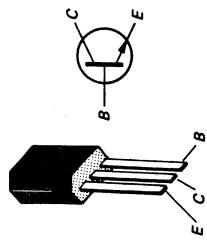
Printed Circuit Board
Part No. 1-539-642-11

6-5. Headphone Amplifier Circuit Board

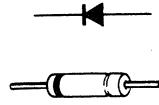
- Component Side -



2SC634A

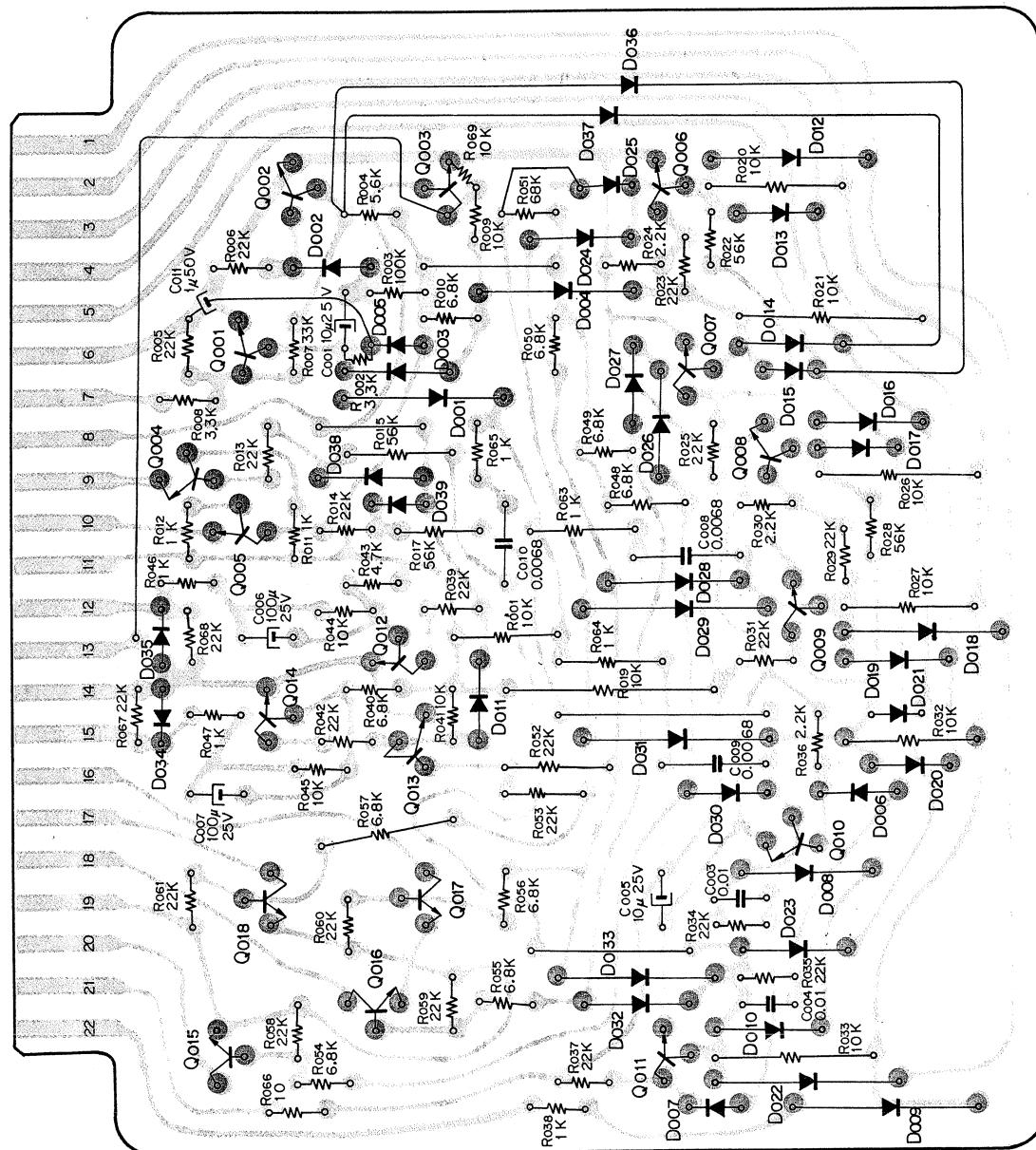


1T22



6-6. System Control Circuit Board (1)

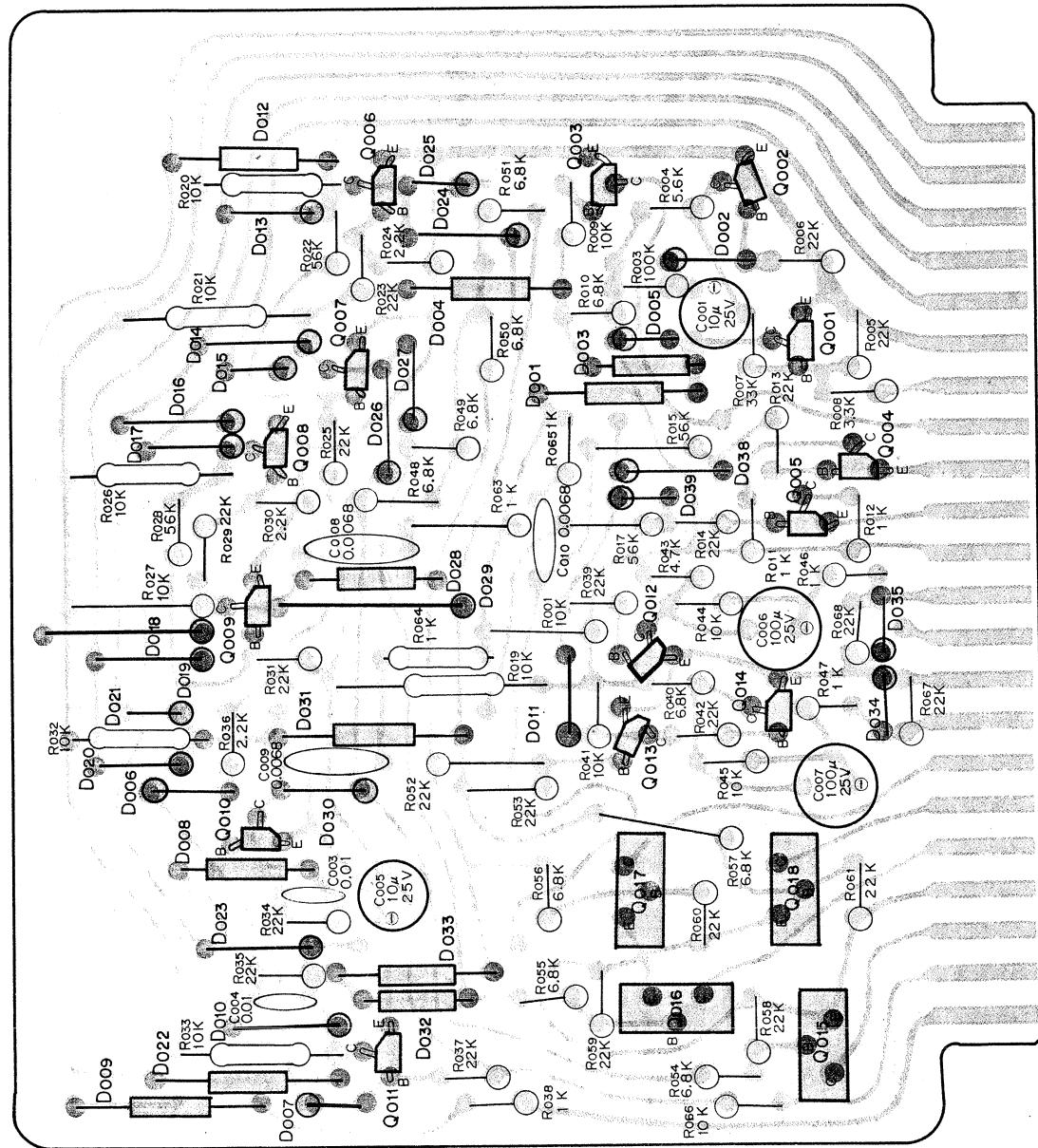
- Conductor Side -



Printed Circuit Board
Part No. 1-539-633-12

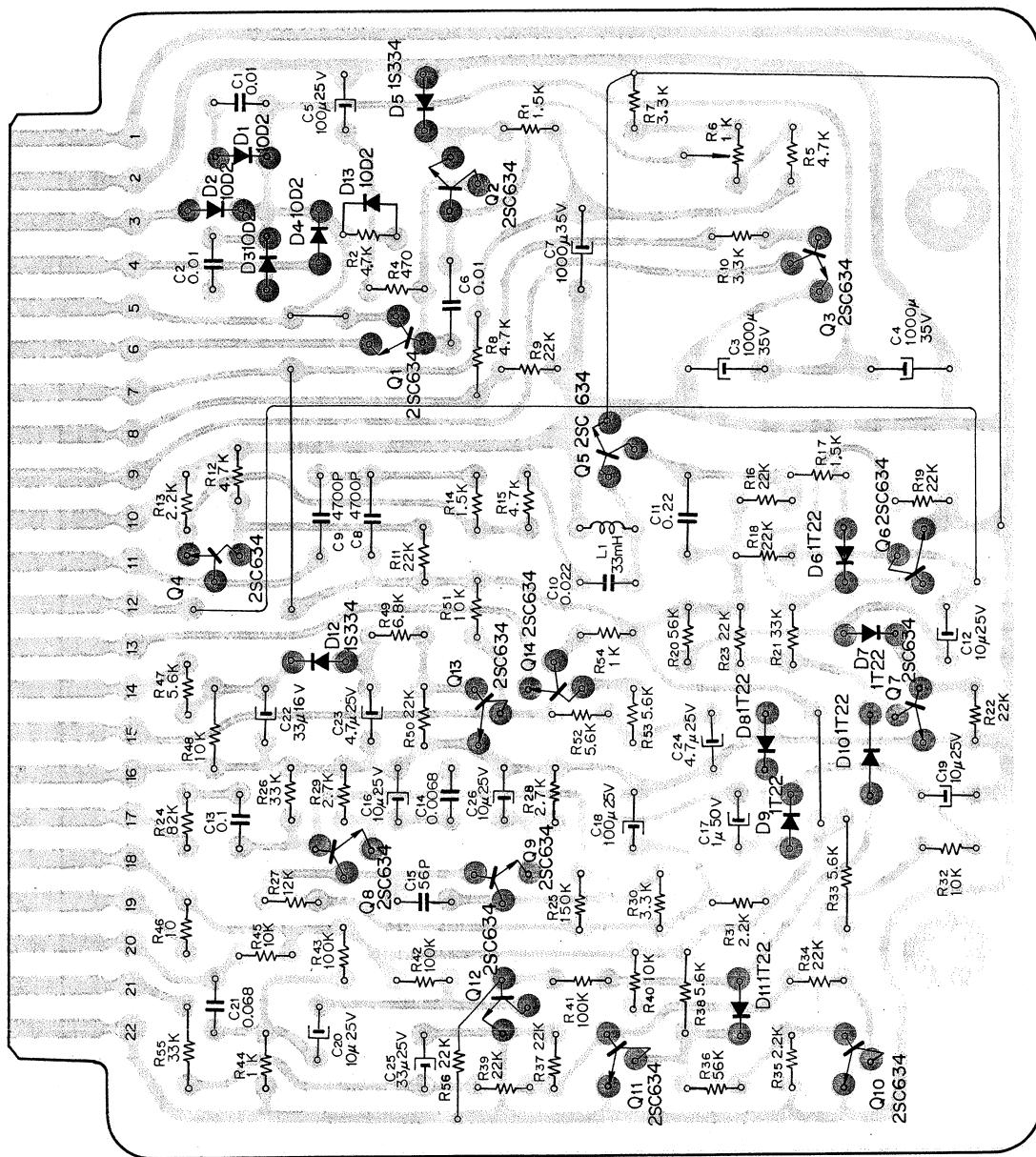
6-6. System Control Circuit Board (1)

— Component Side —



6-7. System Control Circuit Board (2)

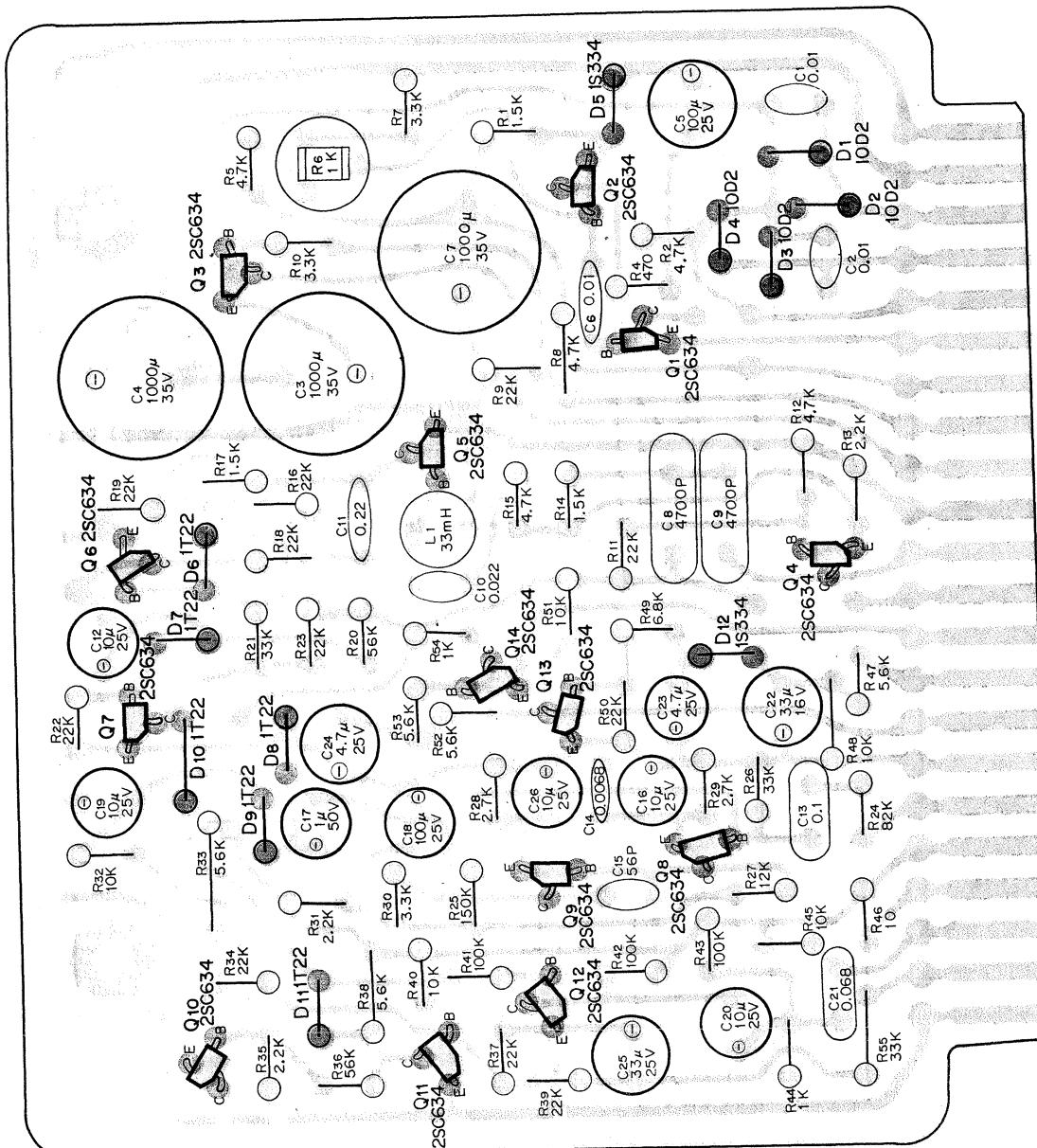
- Conductor Side -



Printed Circuit Board
Part No. 1-539-634-12

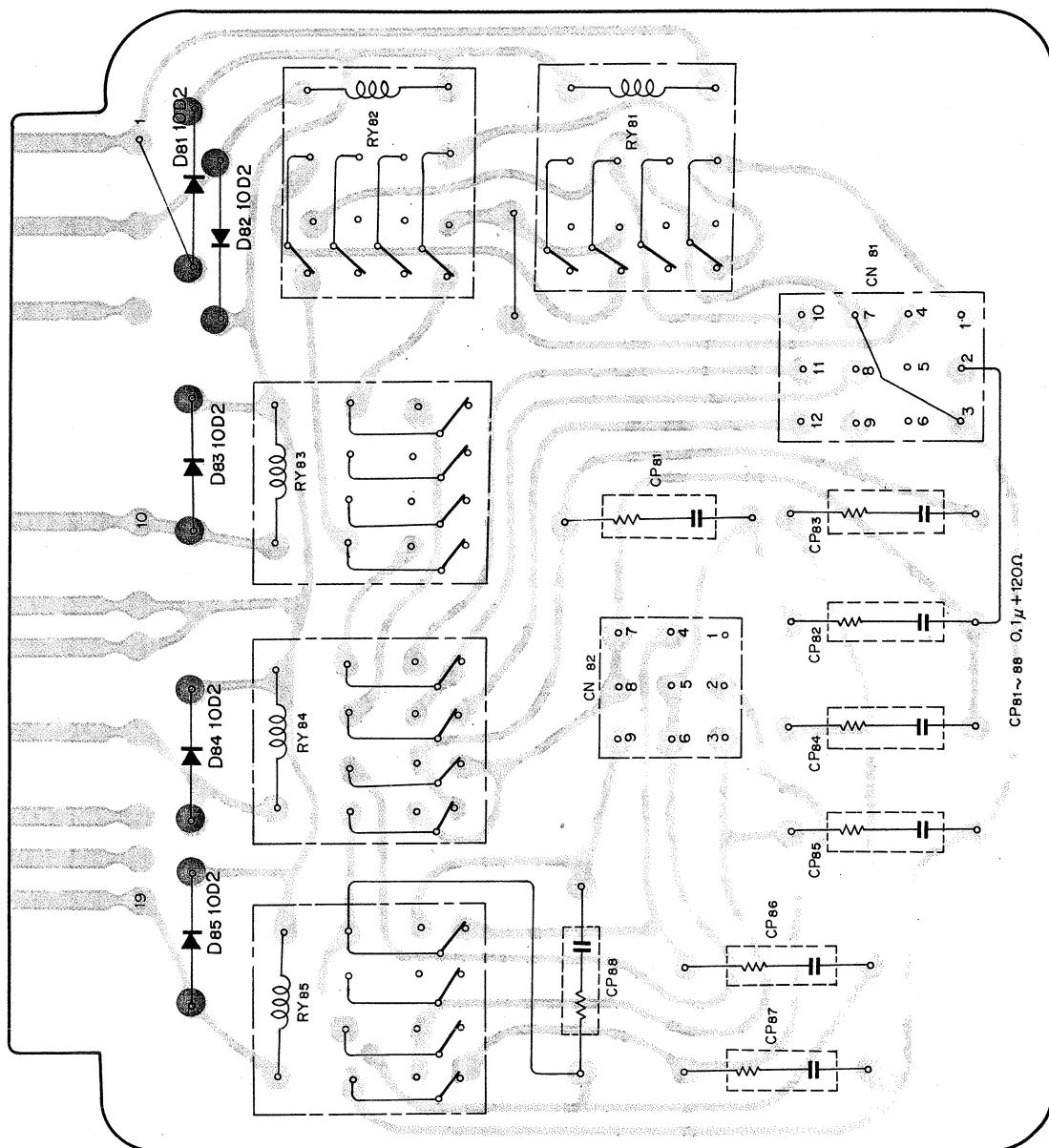
6-7. System Control Circuit Board (2)

- Component Side -



6-8. System Control Circuit Board (3)

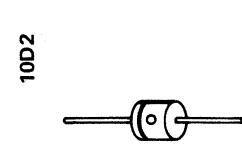
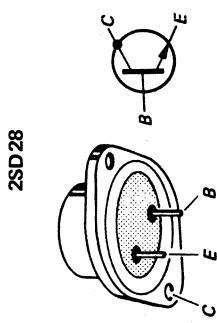
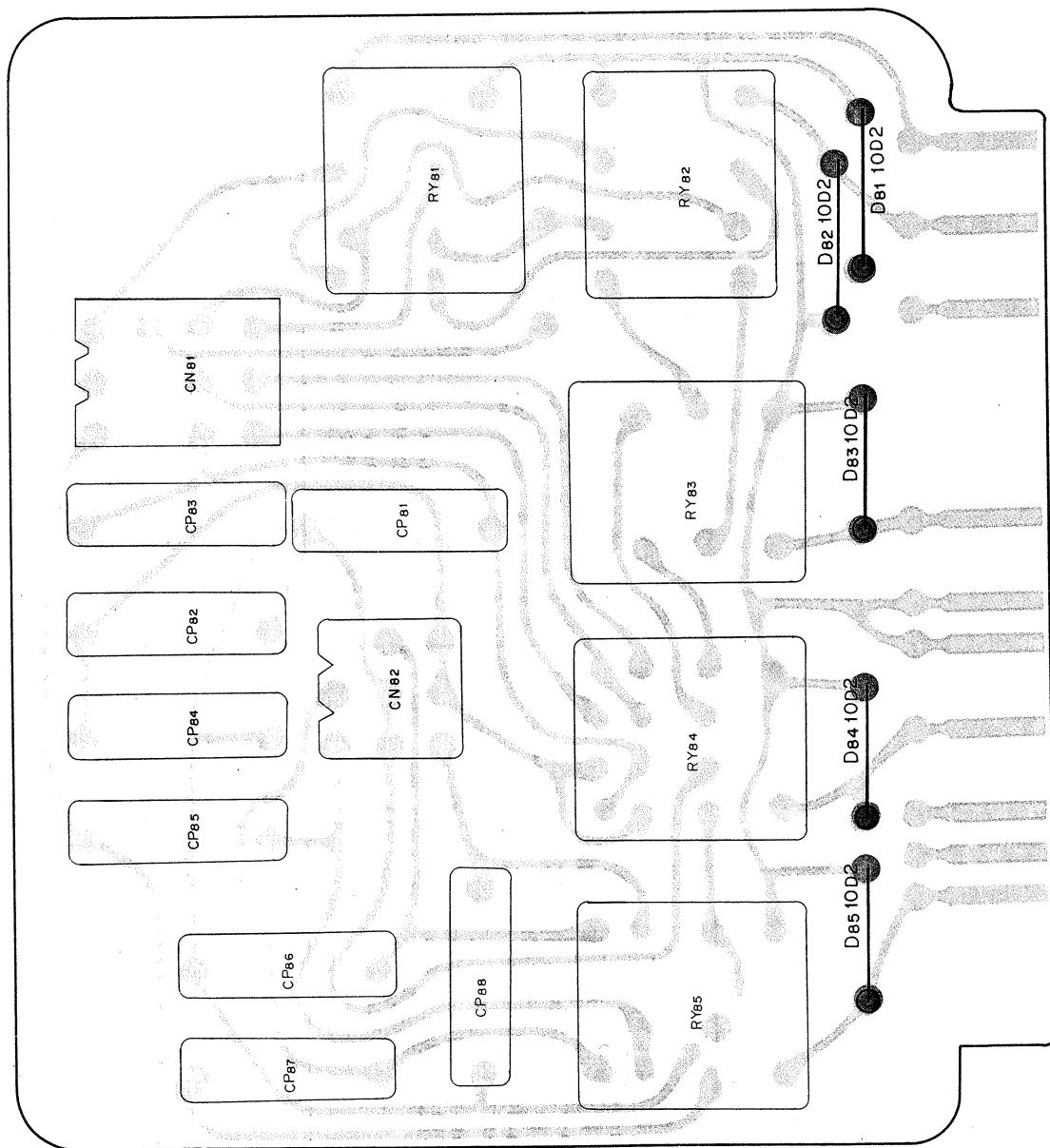
— Conductor Side —



Printed Circuit Board
Part No. 1-539-635-11

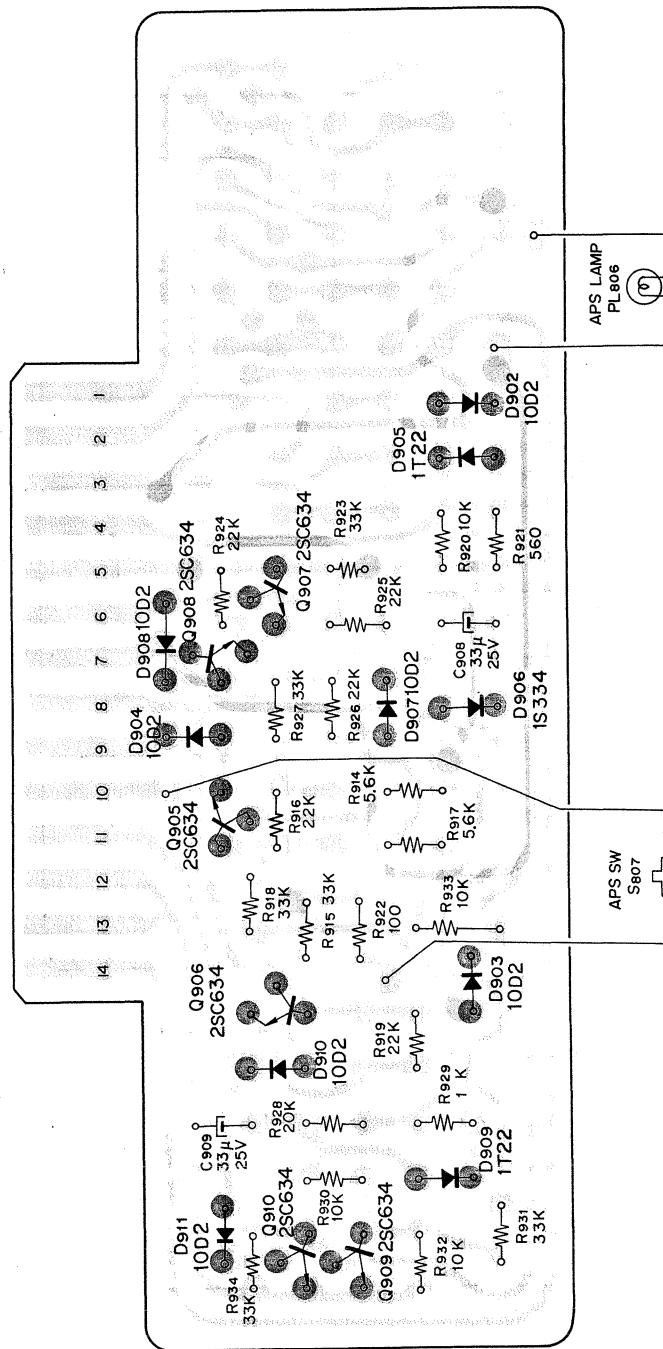
6-8. System Control Circuit Board (3)

— Component Side —



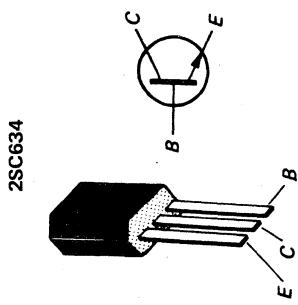
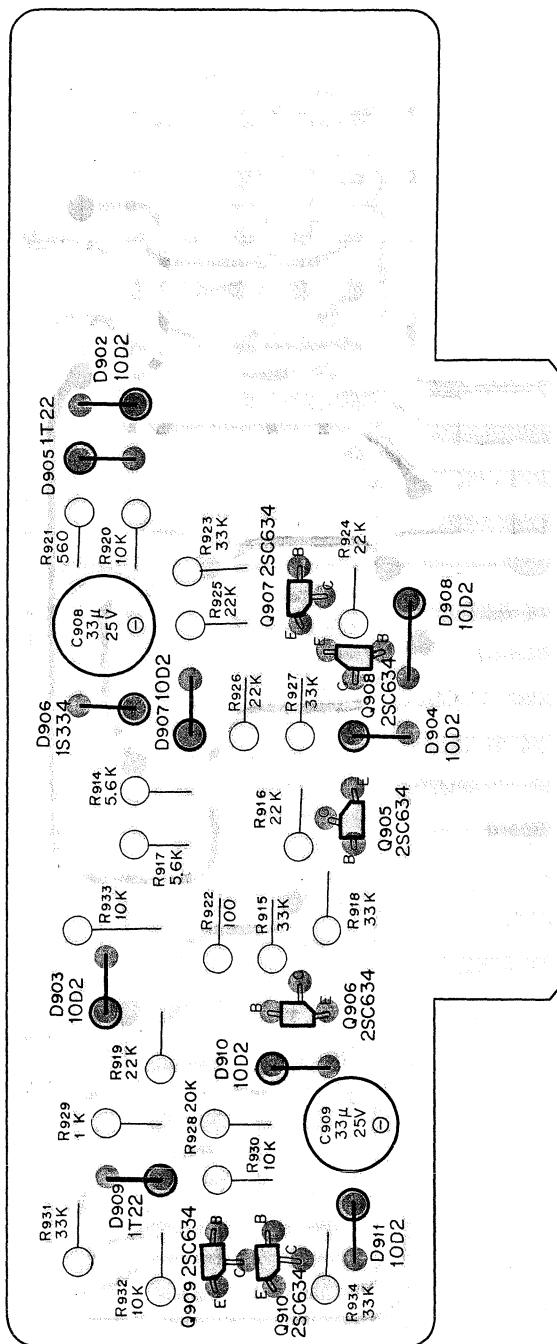
6-9. APS Circuit Board

— Conductor Side —

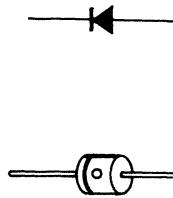


Printed Circuit Board
Part No. 1-539-568-11

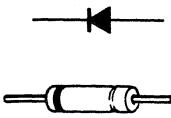
6-9. APS Circuit Board - Component Side -



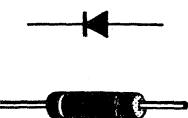
10D2



1122

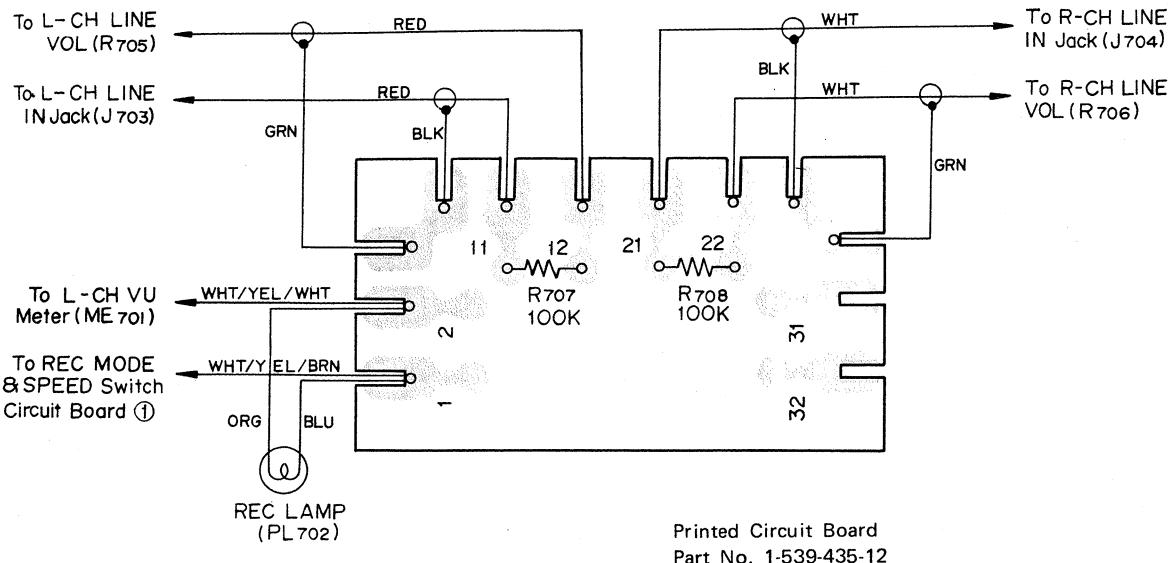


S334



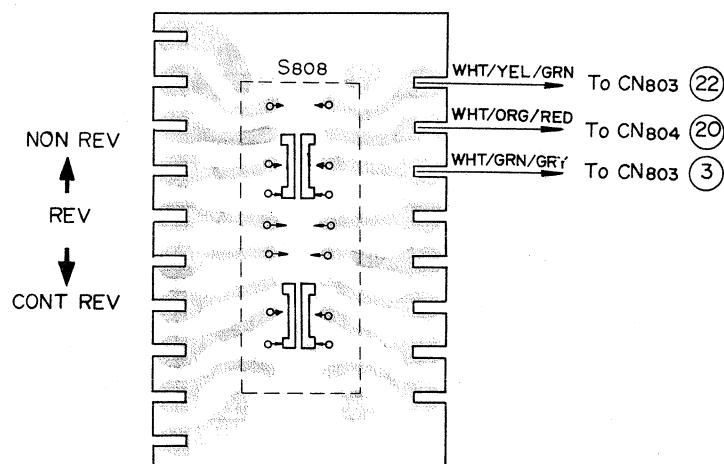
6-10. Resistor Terminal Circuit Board

— Conductor Side —



6-11. ARV Switch Circuit Board

— Conductor Side —



7. ELECTRICAL PARTS LIST

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>			
MOUNTED CIRCUIT BOARDS								
X-31409-60-02	REC amp.		C101, 201	1-121-416	100 μ F 25V electrolytic			
X-31429-71-03	PB amp.		C102, 202	1-121-398	10 μ F 25V electrolytic			
X-31429-81-02	bias osc.		C103, 203	1-121-398	10 μ F 25V electrolytic			
X-31429-78-02	headphone amp.		C104, 204	1-105-661-12	0.001 μ F 50V mylar			
X-31429-82-01	REC mode & speed switch		C105, 205	1-121-413	100 μ F 6.3V electrolytic			
X-31429-57-01	resistor terminal		C106, 206	1-121-398	10 μ F 25V electrolytic			
X-31409-65-01	ECHO & SOS		C107, 207	1-105-661-12	0.001 μ F 50V mylar			
X-31429-75-03	system control (1)		C108, 208	1-121-398	10 μ F 25V electrolytic			
X-31429-76-04	system control (2)		C109, 209	1-121-413	100 μ F 6.3V electrolytic			
X-31429-77-01	system control (3)		C110, 210	1-121-416	100 μ F 25V electrolytic			
X-31429-82-01	APS		C111, 211	1-121-395	4.7 μ F 25V electrolytic			
X-31429-58-01	ARV switch		C112, 212	1-105-661-12	0.001 μ F 50V mylar			
PRINTED CIRCUIT BOARDS								
1-539-431-14	REC amp.		C113, 213	1-105-661-12	0.001 μ F 50V mylar			
1-539-432-12	sub. (REC amp.)		C114, 214	1-121-413	100 μ F 6.3V electrolytic			
1-539-641-11	PB amp.		C115, 215	1-121-395	4.7 μ F 25V electrolytic			
1-539-558-12	bias osc.		C116, 216	1-105-661-12	0.001 μ F 50V mylar			
1-539-563-12	sub. (bias osc.)		C117, 217	1-121-409	47 μ F 16V electrolytic			
1-539-642-11	headphone amp.		C118, 218	1-121-395	4.7 μ F 25V electrolytic			
1-539-565-11	REC mode & speed switch		C119, 219	1-121-395	4.7 μ F 25V electrolytic			
1-539-435-12	resistor terminal		C120, 220	1-121-395	4.7 μ F 25V electrolytic			
1-539-560-11	ECHO & SOS		C121, 221	1-105-661-12	0.001 μ F 50V mylar			
1-539-633-12	system control (1)		C122, 222	1-105-661-12	0.001 μ F 50V mylar			
1-539-634-12	system control (2)		C123, 223	1-107-127	68pF 50V silvered mica			
1-539-635-11	system control (3)		C124, 224	1-121-403	33 μ F 16V electrolytic			
1-539-568-11	APS		C125, 225	1-121-413	100 μ F 6.3V electrolytic			
1-539-443-11	ARV switch		C126, 226	1-121-398	10 μ F 25V electrolytic			
1-539-436-11	head connector		C127, 227	1-105-689-12	0.22 μ F 50V mylar			
1-539-437-11	docking		C128, 228	1-121-416	100 μ F 25V electrolytic			
1-539-663-11	pilot lamp holding		C129, 229	1-105-671-12	0.0068 μ F 50V mylar			
RECORD AMP CIRCUIT								
SEMICONDUCTORS								
Q101, 201	transistor	2SC631A	C130, 230	1-121-413	100 μ F 6.3V electrolytic			
Q102, 202	transistor	2SA610	C131, 231	1-105-685-12	0.1 μ F 50V mylar			
Q103, 203	transistor	2SC631A	C132, 232	1-105-681-12	0.047 μ F 50V mylar			
Q104, 204	transistor	2SC634A	C133, 233	1-105-681-12	0.047 μ F 50V mylar			
Q105, 205	transistor	2SC634A	C134, 234	1-105-677-12	0.022 μ F 50V mylar			
Q106, 206	transistor	2SC634A	C135, 235	1-121-398	10 μ F 25V electrolytic			
D101, 201	diode	10D-2	C136, 236	1-121-398	10 μ F 25V electrolytic			
D102, 202	diode	10D-2	C137, 237	1-121-398	10 μ F 25V electrolytic			
D103, 203	diode	10D-2	C138, 238	1-121-398	10 μ F 25V electrolytic			
D104, 204	diode	10D-2	RESISTORS					
COILS								
L101, 201	1-231-069	equalizer	All resistors are $\frac{1}{4}$ W, carbon type, unless otherwise specified.					
L102, 202	1-231-069	equalizer	R101, 201	1-242-705	22k Ω			
			R102, 202	1-242-701	15k Ω			
			R103, 203	1-242-723	120k Ω			
			R104, 204	1-242-690	5.1k Ω			
			R105, 205	1-242-704	20k Ω			
			R106, 206	1-242-661	330 Ω			
			R107, 207	1-242-701	15k Ω			
			R108, 208	1-242-704	20k Ω			
			R109, 209	1-242-690	5.1k Ω			
			R110, 210	1-242-661	330 Ω			

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
R111, 211	1-242-681	2.2k Ω	D301, 351)		
R112, 212	1-242-713	47k Ω	D401, 451)		diode 10D-2
R113, 213	1-242-729	220k Ω	D302, 352)		
R114, 214	1-242-657	220 Ω	D402, 452)		diode 10D-2
R115, 215	1-242-681	2.2k Ω			
R116, 216	1-242-691	5.6k Ω			COIL
R117, 217	1-242-713	47k Ω	L301, 401	1-407-298	trap 4.7mH
R118, 218	1-242-729	220k Ω			
R119, 219	1-242-657	220 Ω			
R120, 220	1-242-681	2.2k Ω			CAPACITORS
R121, 221	1-242-691	5.6k Ω	C301, 351)	1-121-391	1 μ F 50V electrolytic
R122, 222	1-242-661	330 Ω	C401, 451)		
R123, 223	1-242-690	5.1k Ω	C302, 352)	1-121-410	47 μ F 25V electrolytic
R124, 224	1-242-692	6.2k Ω	C402, 452)		
R125, 225	1-221-383	10k Ω (B)	C303, 353)	1-121-413	100 μ F 6.3V electrolytic
R126, 226	1-242-681	2.2k Ω	C403, 453)		
R127, 227	1-242-707	27k Ω	C304, 354)	1-105-661-12	0.001 μ F 50V mylar
R128, 228	1-242-725	150k Ω	C404, 454)		
R129, 229	1-242-685	3.3k Ω	C305, 355)	1-107-107	10pF 50V silvered mica
R130, 230	1-242-709	33k Ω	C405, 455)		
R131, 231	1-242-665	470 Ω	C306, 356)	1-121-403	33 μ F 16V electrolytic
R132, 232	1-242-709	33k Ω	C406, 456)		
R133, 233	1-242-661	330 Ω	C307, 357)	1-121-416	100 μ F 25V electrolytic
R134, 234	1-242-673	1k Ω	C407, 457)		
R135, 235	1-242-700	13k Ω	C308, 358)	1-121-398	10 μ F 25V electrolytic
R136, 236	1-242-649	100 Ω	C408, 458)		
R137, 237	1-242-681	2.2k Ω	C309, 359)	1-105-675-12	0.015 μ F 50V mylar
R138, 238	1-242-673	1k Ω	C409, 459)		
R139, 239	1-242-697	10k Ω	C310, 410	1-107-242	390pF 50V silvered mica
R140, 240	1-242-733	330k Ω	C311, 411	1-121-391	1 μ F 50V electrolytic
R141, 241	1-242-697	10k Ω	C312, 412	1-121-416	100 μ F 25V electrolytic
R142, 242	1-242-733	330k Ω	C313, 413	1-105-661-12	0.001 μ F 50V mylar
R143, 243	1-242-697	10k Ω	C314, 414	1-121-410	47 μ F 25V electrolytic
R144, 244	1-242-733	330k Ω	C315	1-107-125	56pF 50V silvered mica
R145, 245	1-242-697	10k Ω	C316	1-121-409	47 μ F 16V electrolytic
R146, 246	1-242-733	330k Ω	C317, 417	1-121-398	10 μ F 25V electrolytic
R147, 247	1-242-633	22 Ω	C318, 368)	1-121-398	10 μ F 25V electrolytic
R148, 248	1-242-633	22 Ω	C418, 468)		
R149, 249	1-242-633	22 Ω	C319, 419	1-121-410	47 μ F 25V electrolytic
R150, 250	1-242-633	22 Ω			

PLAYBACK AMP CIRCUIT**SEMICONDUCTORS**

Q301, 351)	transistor	2SC631A
Q401, 451)		
Q302, 352)	transistor	2SC631A
Q402, 452)		
Q303, 403	transistor	2SC634A
Q304, 404	transistor	2SC634A
Q305, 355)	transistor	2SC634A
Q405, 455)		

RESISTORS

All resistors $\frac{1}{4}$ W, carbon type, unless otherwise specified.

R301, 351)	1-242-666	510 Ω
R401, 451)		
R302, 352)	1-242-739	560k Ω
R402, 452)		
R303, 353)	1-242-752	150k Ω
R403, 453)		
R304, 354)	1-242-721	100k Ω
R404, 454)		

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
R305, 355	1-242-647	82Ω	R336, 436	1-242-677	1.5kΩ
R405, 455			R337, 437	1-242-663	390Ω
R306, 356	1-242-707	27kΩ	R338, 438	1-242-657	220Ω
R406, 456			R339, 439		— discarded —
R307, 357	1-242-692	6.2kΩ	R340, 440	1-242-721	100kΩ
R407, 457					
R308, 358	1-242-692	6.2kΩ			
R408, 458					
R309, 359	1-242-731	270kΩ			
R409, 459					
R310, 360		— discarded —			
R410, 460					
R311, 361	1-242-685	3.3kΩ			
R411, 461					
R312, 362	1-242-657	220Ω			
R412, 462					
R313, 363	1-221-311	5kΩ (B)			
R413, 463		semi-fixed			
R314, 364	1-242-673	1kΩ			
R414, 464					
R315, 365	1-221-311	5kΩ (B)			
R415, 465		semi-fixed			
R316, 366	1-242-709	33kΩ			
R416, 466					
R317, 417	1-242-679	1.8kΩ			
R318, 368	1-242-705	22kΩ			
R418, 468					
R319, 369	1-242-707	27kΩ			
R419, 469					
R320, 370	1-242-693	6.8Ω			
R420, 470					
R321, 371	1-242-697	10kΩ			
R421, 471					
R322, 372	1-242-707	27kΩ			
R422, 472					
R323, 373	1-242-685	3.3kΩ			
R423, 473					
R324, 374		— discarded —			
R424, 474					
R325, 375	1-242-699	12kΩ			
R425, 475					
R326, 376		— discarded —			
R426, 476					
R327, 377		— discarded —			
R427, 477					
R328, 428	1-242-681	2.2kΩ			
R329, 429	1-242-705	22kΩ			
R330, 430	1-242-729	220kΩ			
R331, 431	1-242-705	22kΩ			
R332, 432	1-242-709	33kΩ			
R333, 433	1-242-677	1.5kΩ			
R334, 434	1-242-665	470Ω			
R335, 435	1-242-707	27kΩ			

BIAS OSC CIRCUIT**SEMICONDUCTORS**

Q501		transistor	2SC634A
Q502		transistor	2SC634A
Q503		transistor	2SC634A
D501		diode	10D-2

COILS

L501	1-231-069	equalizer	1.8 mH
L502	1-231-069	equalizer	1.8 mH
L503	1-409-038	dummy	1 mH
L504	1-409-038	dummy	1 mH

MICROINDUCTORS

L505	1-407-198		2.2 mH
L506	1-407-198		2.2 mH

TRANSFORMER

T501	1-433-145	bias osc.	
------	-----------	-----------	--

CAPACITORS

C501	1-107-188	620pF	500V	silvered mica
C502	1-107-188	620pF	500V	silvered mica
C503	1-121-416	100μF	25 V	electrolytic
C504	1-121-404	33μF	25 V	electrolytic
C505		— discarded —		
C506	1-121-391	1μF	50 V	electrolytic
C507	1-107-188	620pF	500V	silvered mica
C508	1-107-188	620pF	500V	silvered mica
C509	1-105-663-12	0.0015μF	50 V	mylar
C510	1-109-508	3,900pF	500V	dipped mica
C511	1-141-076	30~200pF		trimmer
C512	1-141-076	30~200pF		trimmer
C513	1-107-181	330pF	500V	silvered mica
C514	1-107-181	330pF	500V	silvered mica
C515	1-107-188	620pF	500V	silvered mica
C516	1-107-188	620pF	500V	silvered mica

RESISTORS

R501	1-242-649	100Ω	1/4 W	carbon
R502	1-242-693	6.8kΩ	1/4 W	carbon
R503	1-242-625	10Ω	1/4 W	carbon
R504	1-242-625	10Ω	1/4 W	carbon
R505	1-242-625	10Ω	1/4 W	carbon

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>		
R506	1-242-725	150kΩ	1/4W	carbon
R507	1-242-725	150kΩ	1/4W	carbon
R508	1-242-667	560Ω	1/4W	carbon

MISCELLANEOUS

RY501	1-515-127	relay, 650Ω 24V
-------	-----------	-----------------

HEADPHONE AMP CIRCUIT**SEMICONDUCTORS**

Q601, 602	transistor	2SC634A
D601, 602	diode	1T22
D611, 612	diode	1T22

TRANSFORMERS

T601, 611	1-427-284	headphone
-----------	-----------	-----------

CAPACITORS

C601, 611	1-121-442	1μF	50V	electrolytic
C602, 612	1-121-472	10μF	25V	electrolytic
C603, 613	1-121-472	10μF	25V	electrolytic
C604, 614	1-121-396	4.7μF	50V	electrolytic
C605, 615	1-121-442	1μF	50V	electrolytic

RESISTORS

R601, 611	1-242-681	2.2kΩ	1/4W	carbon
R602, 612	1-242-697	10kΩ	1/4W	carbon
R603, 613	1-242-697	10kΩ	1/4W	carbon
R604, 614	1-242-721	100kΩ	1/4W	carbon
R605, 615	1-242-737	470kΩ	1/4W	carbon
R606, 616	1-242-723	120kΩ	1/4W	carbon
R607, 617	1-242-681	2.2kΩ	1/4W	carbon
R608, 618	1-221-997	2.2kΩ (B)	semi-fixed	

RECORD MODE & SPEED SWITCH CIRCUIT**SEMICONDUCTORS**

D701	diode	10D-2
------	-------	-------

CAPACITORS

C701	1-109-501	910pF	500V	dipped mica
C702	1-105-689-12	0.22μF	50V	mylar
C703	1-105-689-12	0.22μF	50V	mylar

RESISTORS

R713	1-242-673	1kΩ	1/4W	carbon
R714	1-242-673	1kΩ	1/4W	carbon
R715	1-242-673	1kΩ	1/4W	carbon

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	
		SWITCHES	
S701	1-514-482	1-key, TAPE SPEED	
S702, 703	1-514-728	2-key, REC MODE	

AMP CHASSIS CIRCUIT**RESISTORS**

R701	1-242-691	5.6kΩ	1/4W	carbon
R702	1-242-691	5.6kΩ	1/4W	carbon
R703, 704	1-222-369	20kΩ (A)	variable (MIC)	
R705, 706	1-222-369	20kΩ (A)	variable (LINE INPUT)	
R707		— described in resistor terminal circuit board unit —		
R708		—		
R709	1-242-691	5.6kΩ	1/4W	carbon
R710	1-242-691	5.6kΩ	1/4W	carbon
R711, 712	1-222-313	50kΩ (B)	variable (SOS & ECHO)	
R716	1-242-684	3kΩ	1/4W	carbon
R717	1-242-684	3kΩ	1/4W	carbon
R718, 719	1-222-314	20kΩ (B)	variable (PB)	

JACKS

J703	1-507-142	phono, LINE INPUT (L-CH)
J704	1-507-142	phono, LINE INPUT (R-CH)
J705	1-509-029	DIN CONNECTOR, REC/PB
J706	1-507-142	phono, LINE OUTPUT (L-CH)
J707	1-507-142	phono, LINE OUTPUT (R-CH)
J708	1-507-282	binaural, HEADPHONE
J709		— discarded —
J710		— discarded —
J711	1-507-281	miniature, MIC (L-CH)
J721	1-507-281	miniature, MIC (R-CH)

CONNECTORS

CN701~705	1-507-300	22P, printed circuit board
CN706	1-508-400	3P, nylon
CN707	1-539-437-11	22P, docking; printed circuit board
CN708	1-508-421	9P, nylon (male)

SWITCHES

S704	1-514-324	slide, TAPE SELECTOR
S705		— discarded —
S706	1-514-692	lever, MONITOR
S707	1-514-692	lever, MONITOR

METERS

ME701	1-524-067	VU
ME702	1-524-067	VU

MISCELLANEOUS

TM701	1-536-179	terminal strip, 1-L-1
	1-508-411	terminal, pin (male)

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>		<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	
LAMPS							
PL701		L-CH	VU meter	—	built in VU meter	—	
PL702		L-CH	REC				
PL703		R-CH	VU meter	—	built in VU meter	—	
PL704		R-CH	REC				
RESISTOR TERMINAL CIRCUIT							
RESISTORS							
R707	1-242-721	100k Ω	1/4W	carbon	R001	1-242-697	10k Ω
R708	1-242-721	100k Ω	1/4W	carbon	R002	1-203-894	3.3k Ω
ECHO & SOS CIRCUIT							
CAPACITORS							
C801	1-105-673-12	0.01 μ F	50V	mylar	R003	1-242-721	100k Ω
C802	1-103-863	330pF	50V	polystyrol	R004	1-242-691	5.6k Ω
C803	1-103-863	330pF	50V	polystyrol	R005	1-242-705	22k Ω
C804	1-105-673-12	0.01 μ F	50V	mylar	R006	1-242-705	22k Ω
RESISTORS							
R801	1-242-715	56k Ω	1/4W	carbon	R007	1-242-709	33k Ω
R802	1-242-723	120k Ω	1/4W	carbon	R008	1-242-685	3.3k Ω
R803	— discarded —				R009	1-242-697	10k Ω
R804	1-242-715	56k Ω	1/4W	carbon	R010	1-242-693	6.8k Ω
R805	1-242-723	120k Ω	1/4W	carbon	R011	1-242-673	1k Ω
SWITCH							
S705	1-514-693	3 position lever	—	SOS/OFF/ECHO	R012	1-242-673	1k Ω
SYSTEM CONTROL (1) CIRCUIT							
SEMICONDUCTORS							
Q001~014		transistor	2SC634		R013	1-242-705	22k Ω
Q015~018		transistor	2SC756		R014	1-242-705	22k Ω
D001~039		diode	1T22 (A)		R015	1-244-715	56k Ω
CAPACITORS							
C001	1-121-398	10 μ F	25V	electrolytic	R016	— discarded —	
C002		— discarded —			R017	1-242-715	56k Ω
C003	1-105-673-12	0.01 μ F	50V	mylar	R018	— discarded —	
C004	1-105-673-12	0.01 μ F	50V	mylar	R019	1-244-697	10k Ω
C005	1-121-398	10 μ F	25V	electrolytic	R020	1-244-697	10k Ω
C006	1-121-416	100 μ F	25V	electrolytic	R021	1-244-697	10k Ω
C007	1-121-416	100 μ F	25V	electrolytic	R022	1-242-715	56k Ω
C008	1-105-671-12	0.0068 μ F	50V	mylar	R023	1-242-705	22k Ω
C009	1-105-671-12	0.0068 μ F	50V	mylar	R024	1-242-681	2.2k Ω
C010	1-105-671-12	0.0068 μ F	50V	mylar	R025	1-242-705	22k Ω
C011	1-121-391	1 μ F	50V	electrolytic	R026	1-244-697	10k Ω
RESISTORS							
				R027	1-244-697	10k Ω	
				R028	1-242-715	56k Ω	
				R029	1-242-705	22k Ω	
				R030	1-242-681	2.2k Ω	
				R031	1-242-705	22k Ω	
				R032	1-244-697	10k Ω	
				R033	1-244-697	10k Ω	
				R034	1-242-705	22k Ω	
				R035	1-242-705	22k Ω	
				R036	1-242-681	2.2k Ω	
				R037	1-242-705	22k Ω	
				R038	1-242-673	1k Ω	
				R039	1-242-705	22k Ω	
				R040	1-242-693	6.8k Ω	
				R041	1-242-697	10k Ω	
				R042	1-242-705	22k Ω	
				R043	1-242-689	4.7k Ω	
				R044	1-242-697	10k Ω	
				R045	1-242-697	10k Ω	
				R046	1-242-673	1k Ω	
				R047	1-242-673	1k Ω	
				R048	1-242-693	6.8k Ω	
				R049	1-242-693	6.8k Ω	
				R050	1-242-693	6.8k Ω	

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>		<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	
R051	1-242-693	6.8kΩ		C18	1-121-416	100μF	25V electrolytic
R052	1-242-705	22kΩ		C19	1-121-398	10μF	25V electrolytic
R053	1-242-705	22kΩ		C20	1-121-398	10μF	25V electrolytic
R054	1-242-693	6.8kΩ		C21	1-105-683-12	0.068μF	50V mylar
R055	1-242-693	6.8kΩ		C22	1-121-403	33μF	16V electrolytic
R056	1-242-693	6.8kΩ		C23	1-121-395	4.7μF	25V electrolytic
R057	1-244-693	6.8kΩ		C24	1-121-395	4.7μF	25V electrolytic
R058	1-242-705	22kΩ		C25	1-121-404	33μF	25V electrolytic
R059	1-242-705	22kΩ		C26	1-121-398	10μF	25V electrolytic
R060	1-242-705	22kΩ		RESISTORS			
R061	1-242-705	22kΩ		All resistors are $\frac{1}{4}$ W, carbon type, unless otherwise specified.			
R062		— discarded —		R1	1-242-677	1.5kΩ	
R063	1-244-673	1kΩ		R2	1-242-689	4.7kΩ	
R064	1-244-673	1kΩ		R3		— discarded —	
R065	1-242-673	1kΩ		R4	1-242-665	470Ω	
R066		— discarded —		R5	1-242-689	4.7kΩ	
R067	1-242-705	22kΩ		R6	1-222-804	1kΩ (B)	semi-fixed
R068	1-242-705	22kΩ		R7	1-242-685	3.3kΩ	
SYSTEM CONTROL (2) CIRCUIT				R8	1-242-689	4.7kΩ	
SEMICONDUCTORS				R9	1-242-705	22kΩ	
Q1~14		transistor	2SC634	R10	1-242-685	3.3kΩ	
D1~4		diode	10D-2	R11	1-242-705	22kΩ	
D5		diode, zener	1S334	R12	1-242-683	2.7kΩ	
D6		diode	10D-2	R13	1-242-681	2.2kΩ	
D7~11		diode	1T22 (A)	R14	1-242-677	1.5kΩ	
D12		diode, zener	1S334	R15	1-242-689	4.7kΩ	
D13		diode	10D-2	R16	1-242-705	22kΩ	
COIL				R17	1-242-677	1.5kΩ	
L1	1-407-212	33mH		R18	1-242-705	22kΩ	
CAPACITORS				R19	1-242-705	22kΩ	
C1	1-105-753-12	0.01μF	200V mylar	R20	1-242-715	56kΩ	
C2	1-105-753-12	0.01μF	200V mylar	R21	1-242-709	33kΩ	
C3	1-121-388	1,000μF	35V electrolytic	R22	1-242-705	22kΩ	
C4	1-121-388	1,000μF	35V electrolytic	R23	1-242-705	22kΩ	
C5	1-121-416	100μF	25V electrolytic	R24	1-242-719	82kΩ	
C6	1-105-673-12	0.01μF	50V mylar	R25	1-242-725	150kΩ	
C7	1-121-388	1,000μF	35V electrolytic	R26	1-242-709	33kΩ	
C8	1-103-791	4,700pF	50V polystyrol	R27	1-242-699	12kΩ	
C9	1-103-791	4,700pF	50V polystyrol	R28	1-242-683	2.7kΩ	
C10	1-105-677-12	0.022μF	50V mylar	R29	1-242-683	2.7kΩ	
C11	1-105-689-12	0.22μF	50V mylar	R30	1-242-685	3.3kΩ	
C12	1-121-398	10μF	25V electrolytic	R31	1-242-681	2.2kΩ	
C13	1-105-685-12	0.1μF	50V mylar	R32	1-242-697	10kΩ	
C14	1-105-671-12	0.0068μF	50V mylar	R33	1-242-691	5.6kΩ	
C15	1-107-125	56pF	50V silvered mica	R34	1-242-705	22kΩ	
C16	1-121-398	10μF	25V electrolytic	R35	1-242-681	2.2kΩ	
C17	1-121-391	1μF	50V electrolytic	R36	1-242-715	56kΩ	
				R37	1-242-705	22kΩ	
				R38	1-242-691	5.6kΩ	
				R39	1-242-705	22kΩ	
				R40	1-242-697	10kΩ	

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>			<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>							
R41	1-242-721	100kΩ			TRANSFORMER									
R42	1-242-721	100kΩ			T801	1-441-650	power							
R43	1-242-721	100kΩ			CAPACITORS									
R44	1-242-673	1kΩ			C801	1-117-040	2μF + 0.5μF	300V, MP						
R45	1-242-697	10kΩ			C802	1-117-054	0.5μF	350V, MP						
R46	1-257-825	10Ω	½W		C803	1-117-054	0.5μF	350V, MP						
R47	1-242-691	5.6kΩ			C804	1-117-082	4μF	250V, MP						
R48	1-242-697	10kΩ			C805	1-117-082	4μF	250V, MP						
R49	1-242-693	6.8kΩ			WIRE WOUND RESISTORS									
R50	1-242-705	22kΩ			R801	1-205-447	50Ω	25W						
R51	1-242-697	10kΩ			R802	1-205-503	68Ω	40W						
R52	1-242-691	5.6kΩ			R803	1-207-273	5.1Ω	1.5W						
R53	1-242-691	5.6kΩ			R804	1-207-273	5.1Ω	1.5W						
R54	1-242-673	1kΩ			CONNECTORS									
R55	1-242-709	33kΩ			CN801	1-509-341	POWER OUTPUT, UNSWITCHED							
R56	1-242-705	22kΩ			CN802	1-509-062	POWER SUPPLY							
SYSTEM CONTROL (3) CIRCUIT														
SEMICONDUCTORS														
D81~85		diode	10D-2		CN803	1-507-300	22P, system control circuit board (1)							
RELAYS														
RY81	1-515-127	REW,	680Ω	29.5 mA	CN804	1-507-300	22P, system control circuit board (2)							
RY82	1-515-127	F.F.,	680Ω	29.5 mA	CN805	1-507-300	22P, system control circuit board (3)							
RY83	1-515-127	PLAY,	680Ω	29.5 mA	CN806		– included in mechanical parts –							
RY84	1-515-127	REV,	680Ω	29.5 mA	CN807	1-507-301	18P, head assembly							
RY85	1-515-127	SPEED,	680Ω	29.5 mA	CN808	1-507-307	14P							
ENCAPSULATED COMPONENTS														
CP81~88	1-101-534	0.1μF + 120Ω	500V		CN809	1-509-371	3P							
CONNECTORS														
CN81	1-508-417-21	12P	(red)		CN810	1-509-377	9P, DOCKING, (white)							
CN82	1-508-418-21	9P	(red)		CN811	1-509-379	12P, POWER SUPPLY, (red)							
MISCELLANEOUS														
	1-535-041	pin terminal			CN812	1-509-381	9P, CAPSTAN MOTOR, (red)							
MECHA CHASSIS CIRCUIT														
SEMICONDUCTORS														
Q801		transistor	2SD28		ENCAPSULATED COMPONENTS									
Q802		transistor	2SD28		CP801	1-101-534	0.1μF + 120Ω	500V						
Q803		transistor	2SD28		CP802	1-101-534	0.1μF + 120Ω	500V						
D801		diode	10D-2		SOLENOIDS									
D802		diode	10D-2		PM801	1-454-052	pinch roller							
D803		diode	10D-2		PM802	1-454-053	brake							

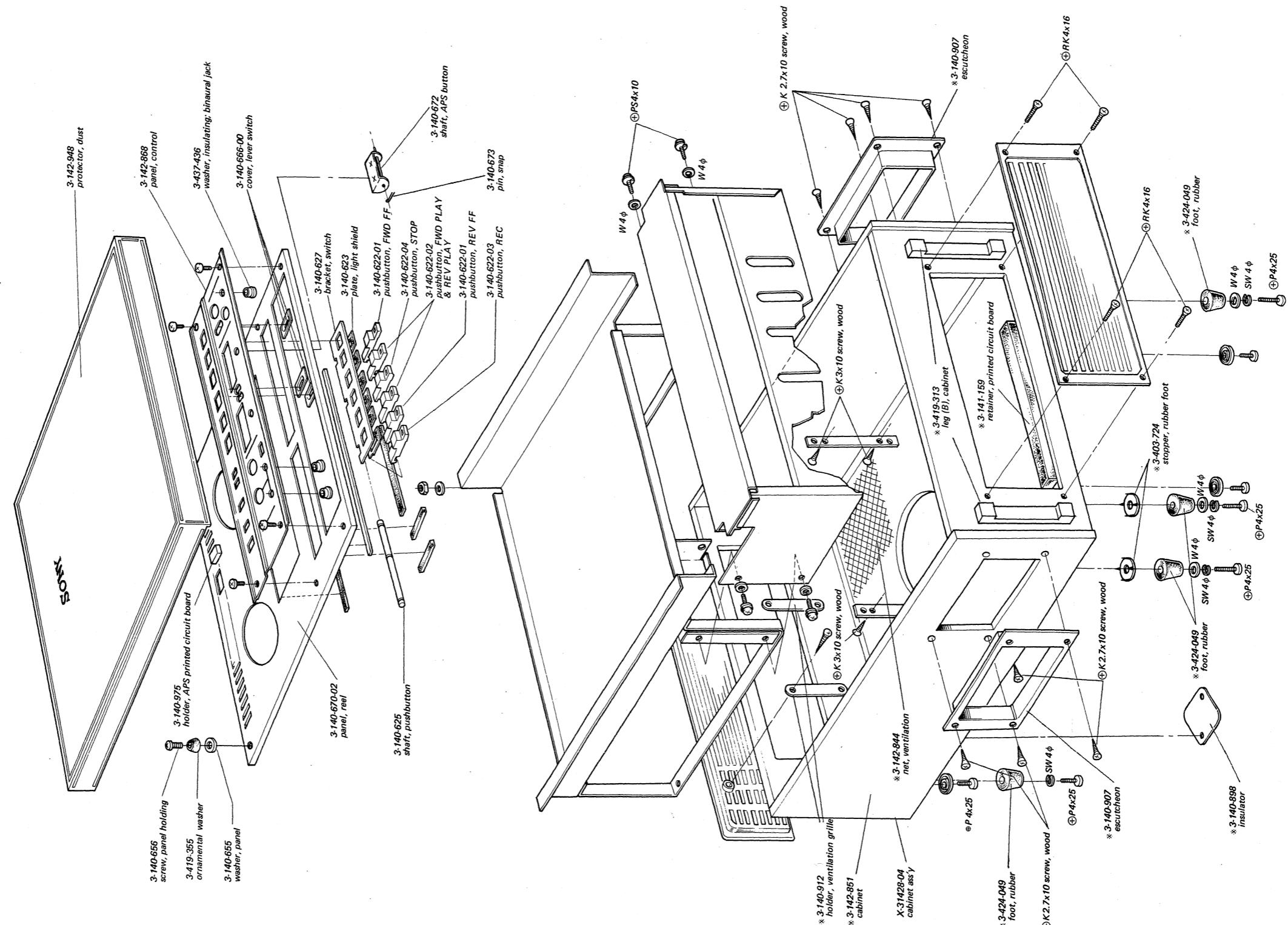
<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
MOTORS		
M801	8-836-624-09	reel; induction; left (UC-624K1)
M802	8-831-634-15	capstan; synchronous (HC-634D6)
M803	8-836-624-07	reel; induction; right (UC-624K)
SOCKETS		
PLB1	1-517-018	lamp
PLB2	1-517-018	lamp
PLB3	1-517-018	lamp
PLB4	1-517-018	lamp
PLB5	1-517-018	lamp
LAMPS		
PL801	1-518-053-11	RECORD
PL802	1-518-053-11	REWIND
PL803	1-518-053-11	REVERSE PLAY
PL804	1-518-053-11	FORWARD PLAY
PL805	1-518-053-11	FF
PL806	1-518-053-11	APS
TERMINAL STRIP		
TM801	1-536-151	2-L-2
TM802	1-536-213	5P
TM803	1-536-179	1-L-1, C type
MISCELLANEOUS		
F	1-533-048	holder, fuse
	1-532-100	fuse, 2A
	1-509-372	pin terminal
	3-140-900	cord, ribbon
HEAD DECK UNIT		
HEADS		
PBH1	8-829-142-20	playback (PP102-4202)
PBH2	8-829-142-20	playback (PP102-4202)
REC-H	8-824-629-20	record (RP102-2902)
ERASE-H	8-826-629-25	erase (EF18-2902A1)
S-H	1-459-051	sensing

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
APS CIRCUIT		
SEMICONDUCTORS		
Q905~910		transistor 2SC634A
DIODES		
D902		diode 10D-2
D903		diode 10D-2
D904		diode 10D-2
D905		diode 1T22 (A)
D906		diode, zener 1S334
D907		diode 10D-2
D908		diode 10D-2
D909		diode 1T22 (A)
D910		diode 10D-2
D911		diode 10D-2
CAPACITORS		
C908	1-121-286	33 μ F 25V electrolytic
C909	1-121-286	33 μ F 25V electrolytic
RESISTORS		
All resistors are $\frac{1}{4}$ W, carbon type, unless otherwise specified.		
R914	1-242-691	5.6 k Ω
R915	1-242-709	33 k Ω
R916	1-242-705	22 k Ω
R917	1-242-691	5.6 k Ω
R918	1-242-709	33 k Ω
R919	1-242-705	22 k Ω
R920	1-242-697	10 k Ω
R921	1-242-667	560 Ω
R922	1-242-649	100 Ω
R923	1-242-709	33 k Ω
R924	1-242-705	22 k Ω
R925	1-242-705	22 k Ω
R926	1-242-705	22 k Ω
R927	1-242-709	33 k Ω
R928	1-242-704	20 k Ω
R929	1-242-673	1 k Ω
R930	1-242-697	10 k Ω
R931	1-242-709	33 k Ω
R932	1-242-697	10 k Ω
R933	1-242-697	10 k Ω
R934	1-242-709	33 k Ω

TC-651 **TC-651**

8. EXPLODED VIEWS

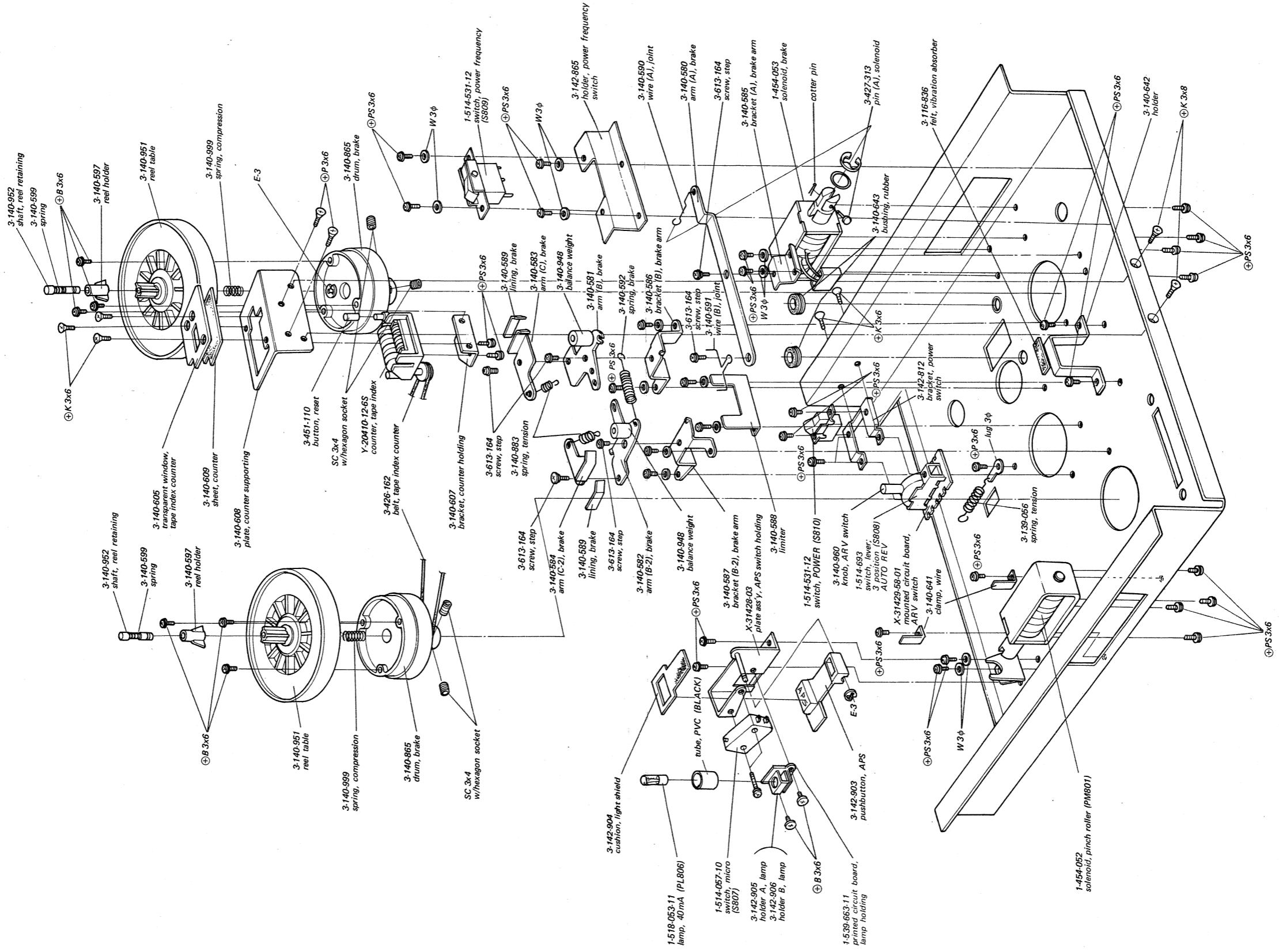
8-1. Cabinet – top view –



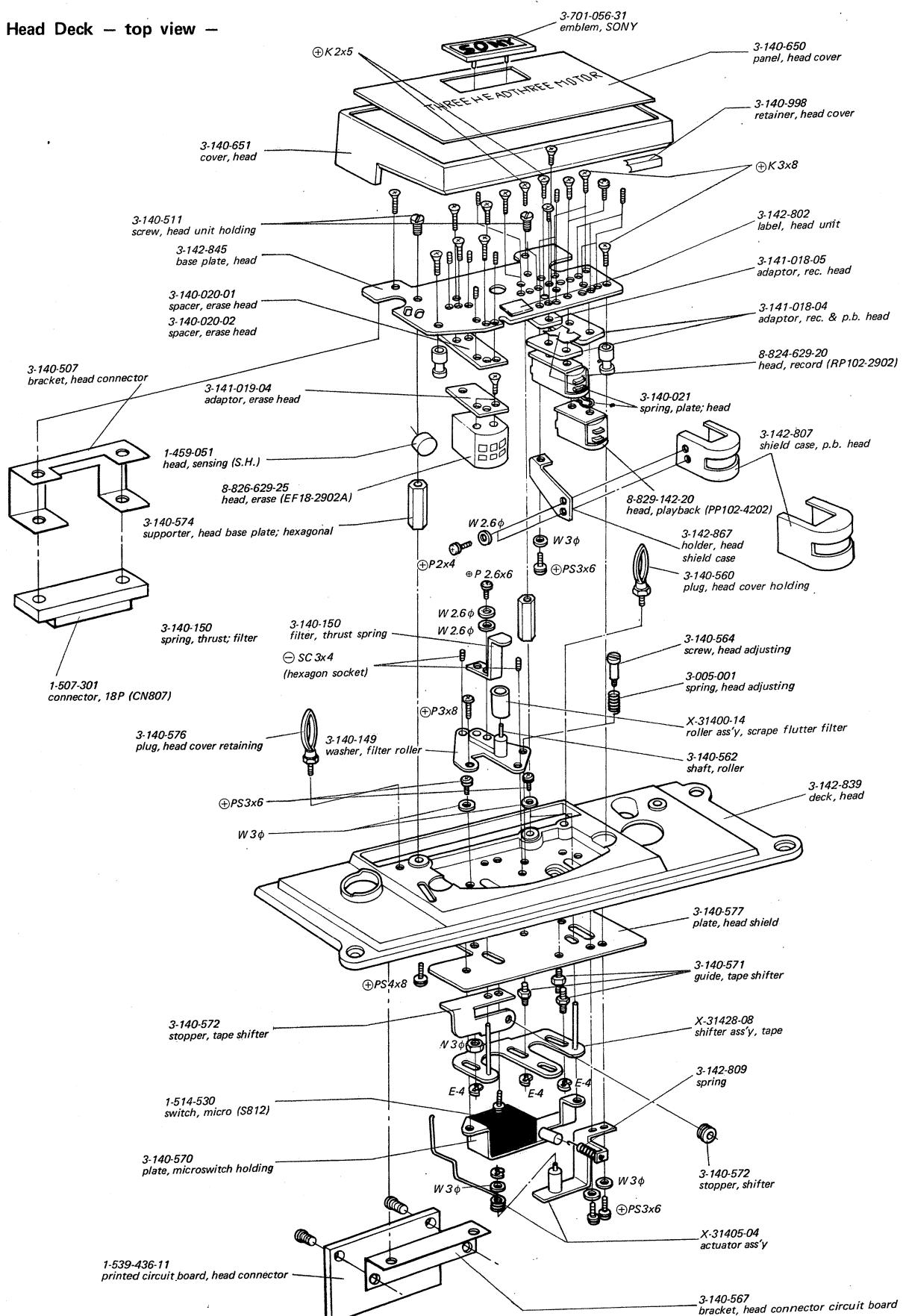
Parts marked with \diamond are included in cabinet ass'y (X-31428-04).

TC-651 **TC-651**

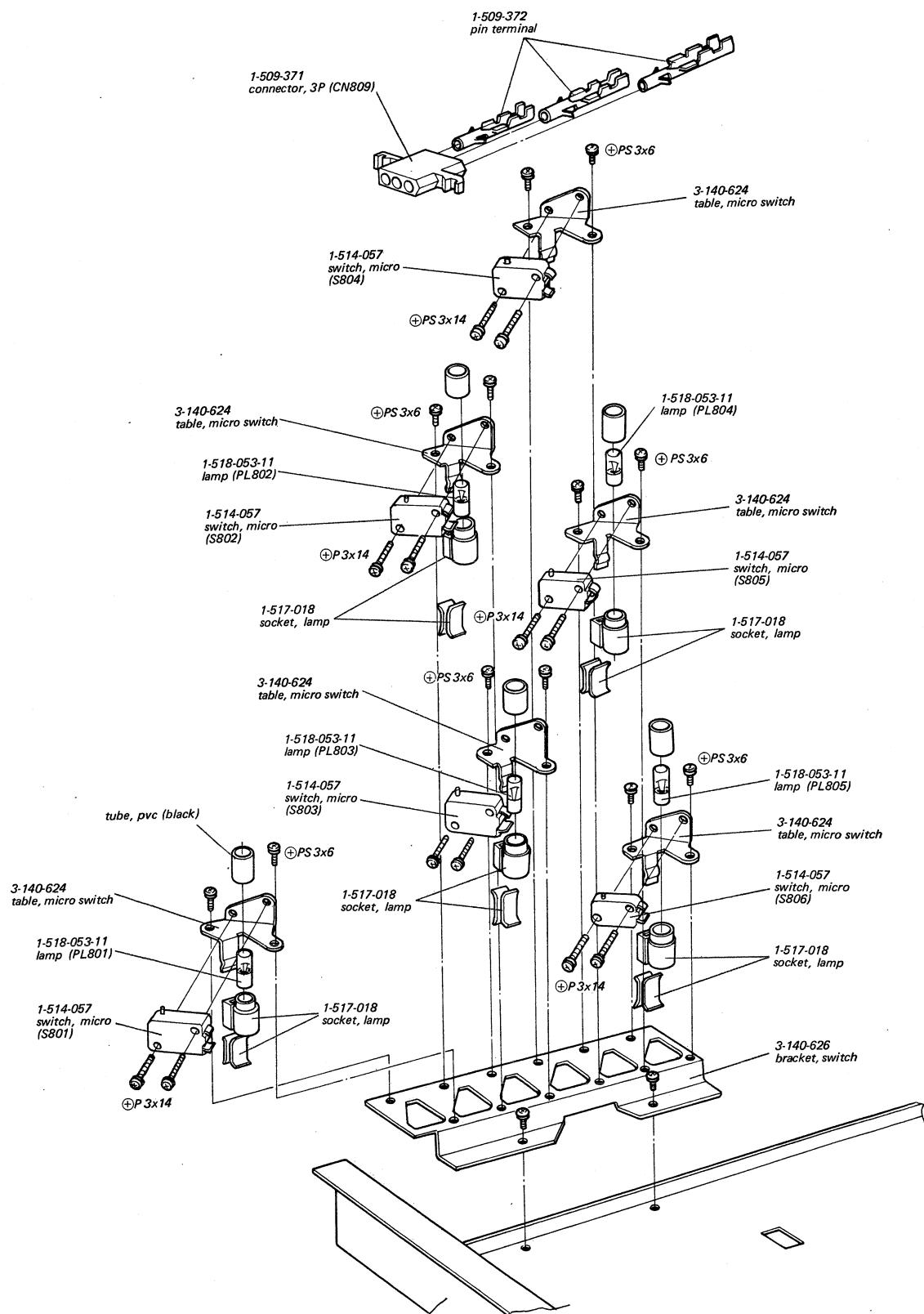
8-2. Chassis – top view –



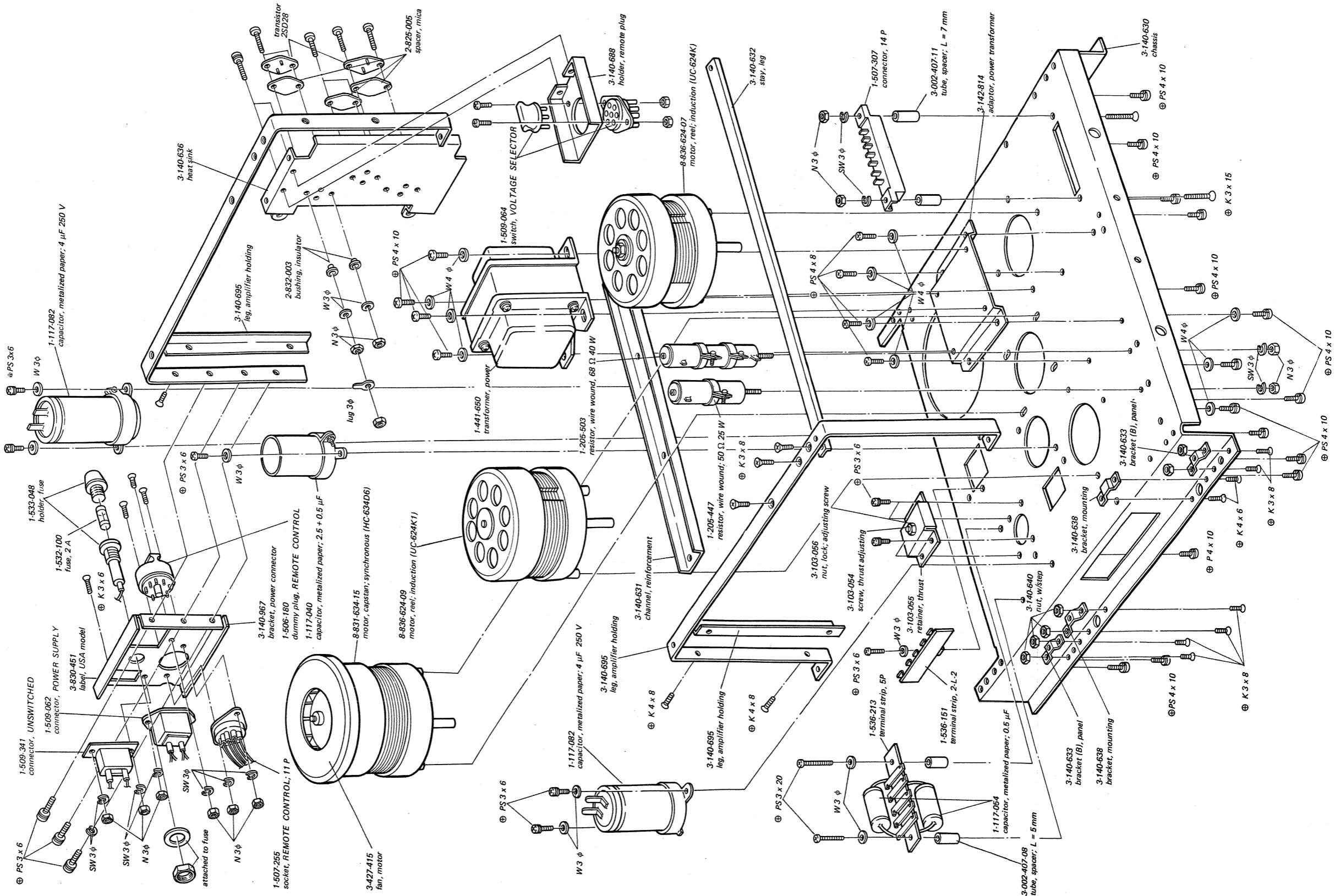
8-3. Head Deck — top view —



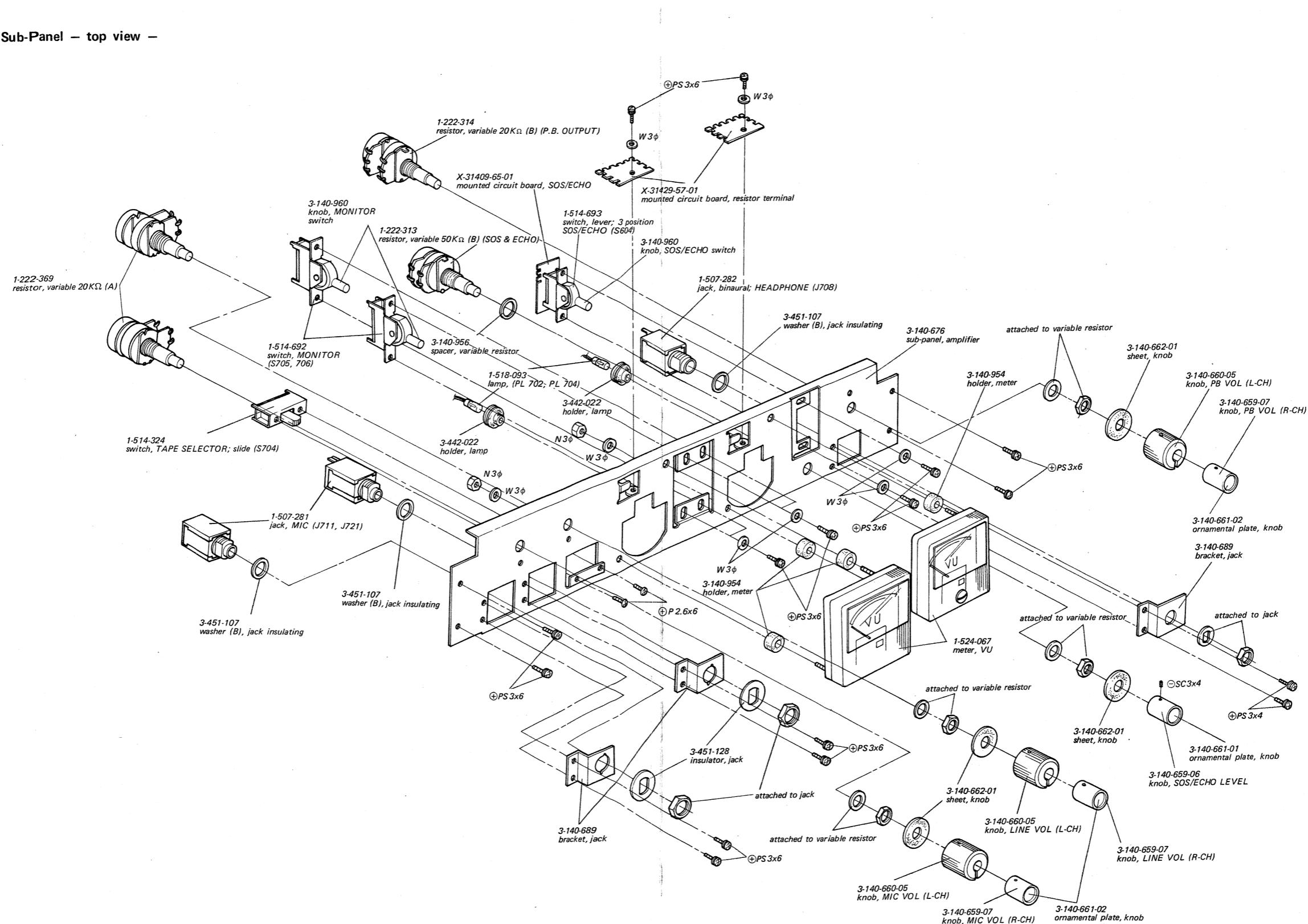
8-4. Microswitches View



8-5. Chassis – bottom view –

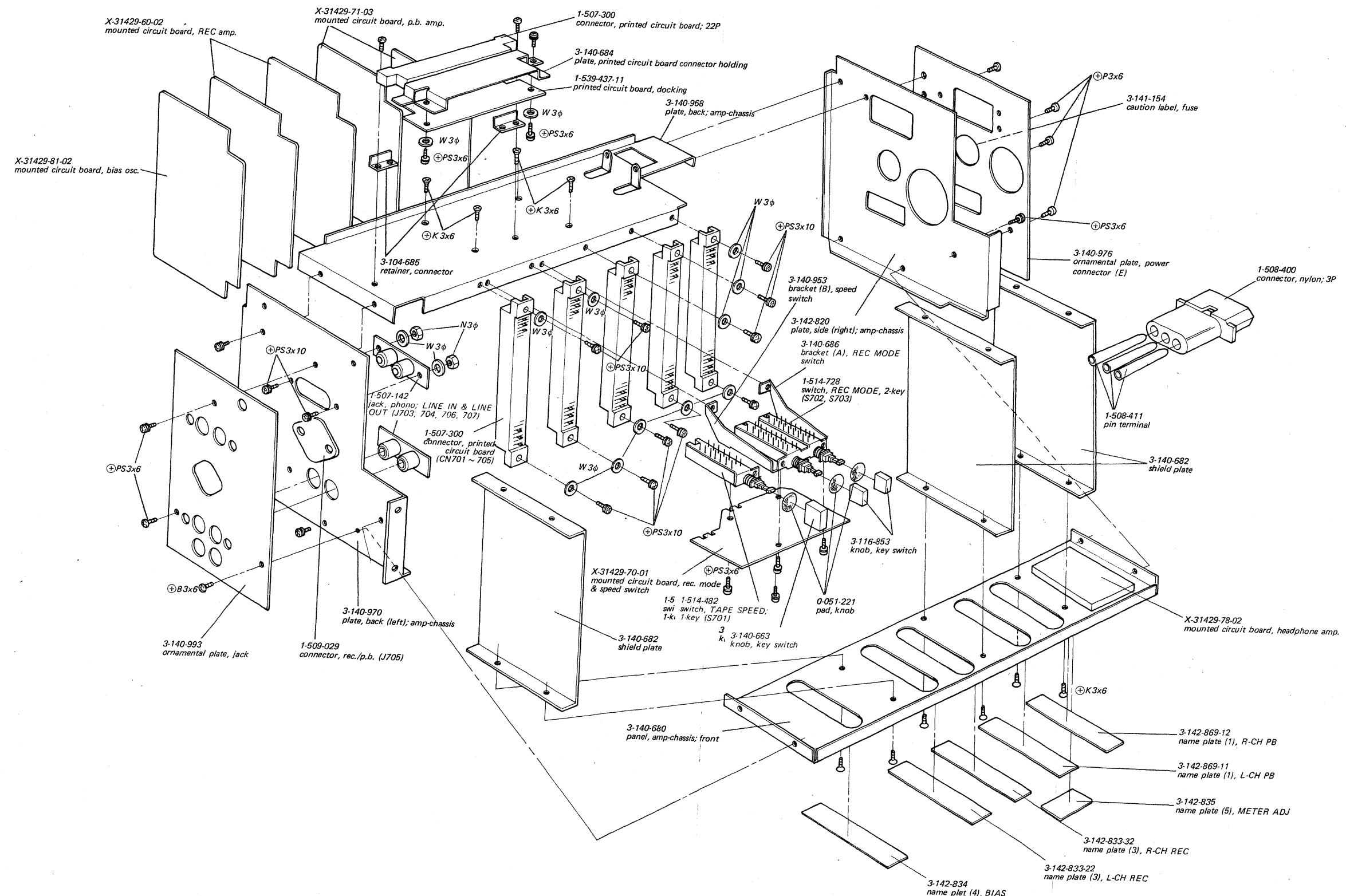


8-6. Amp. Sub-Panel – top view –

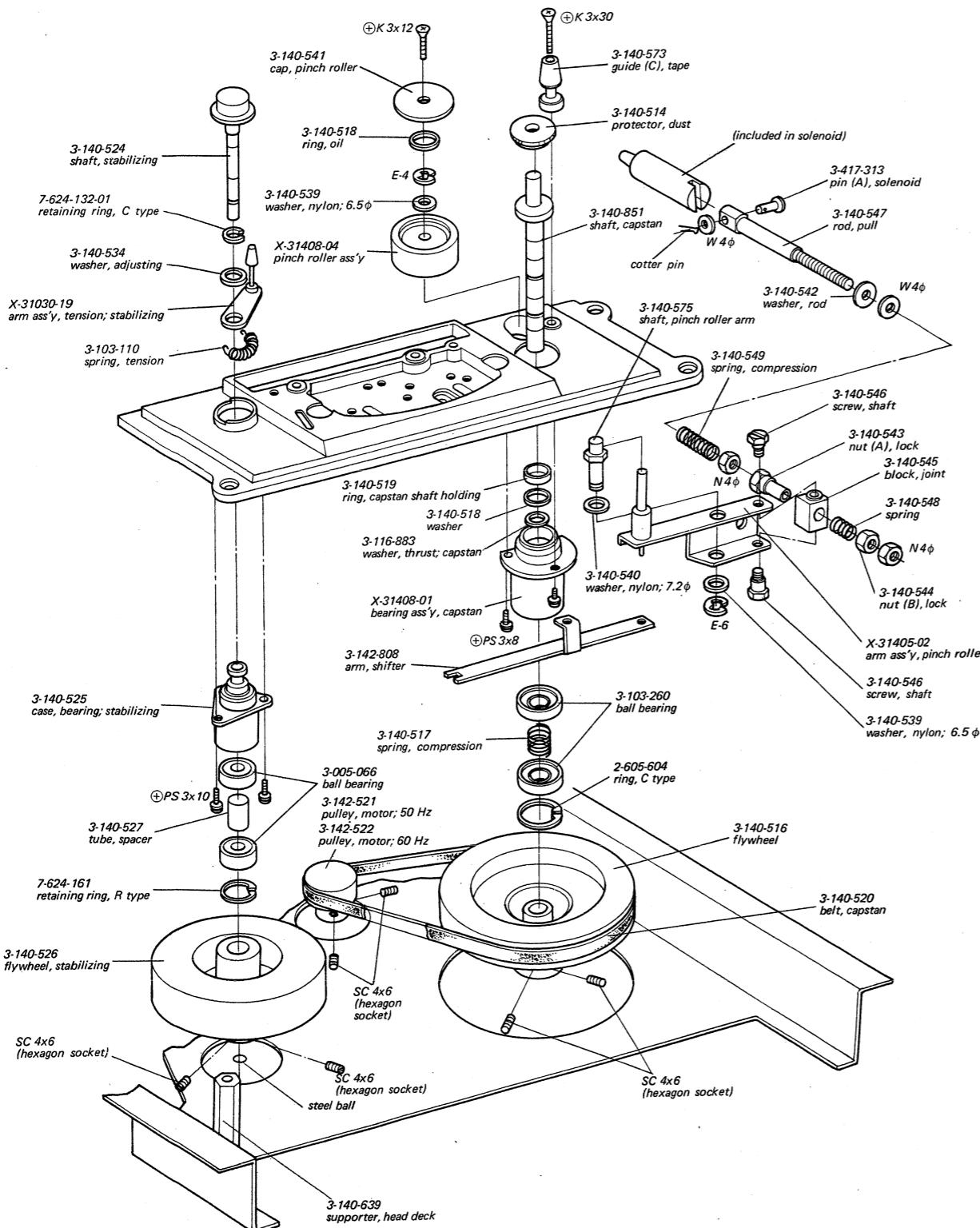


TC-651 **TC-651**

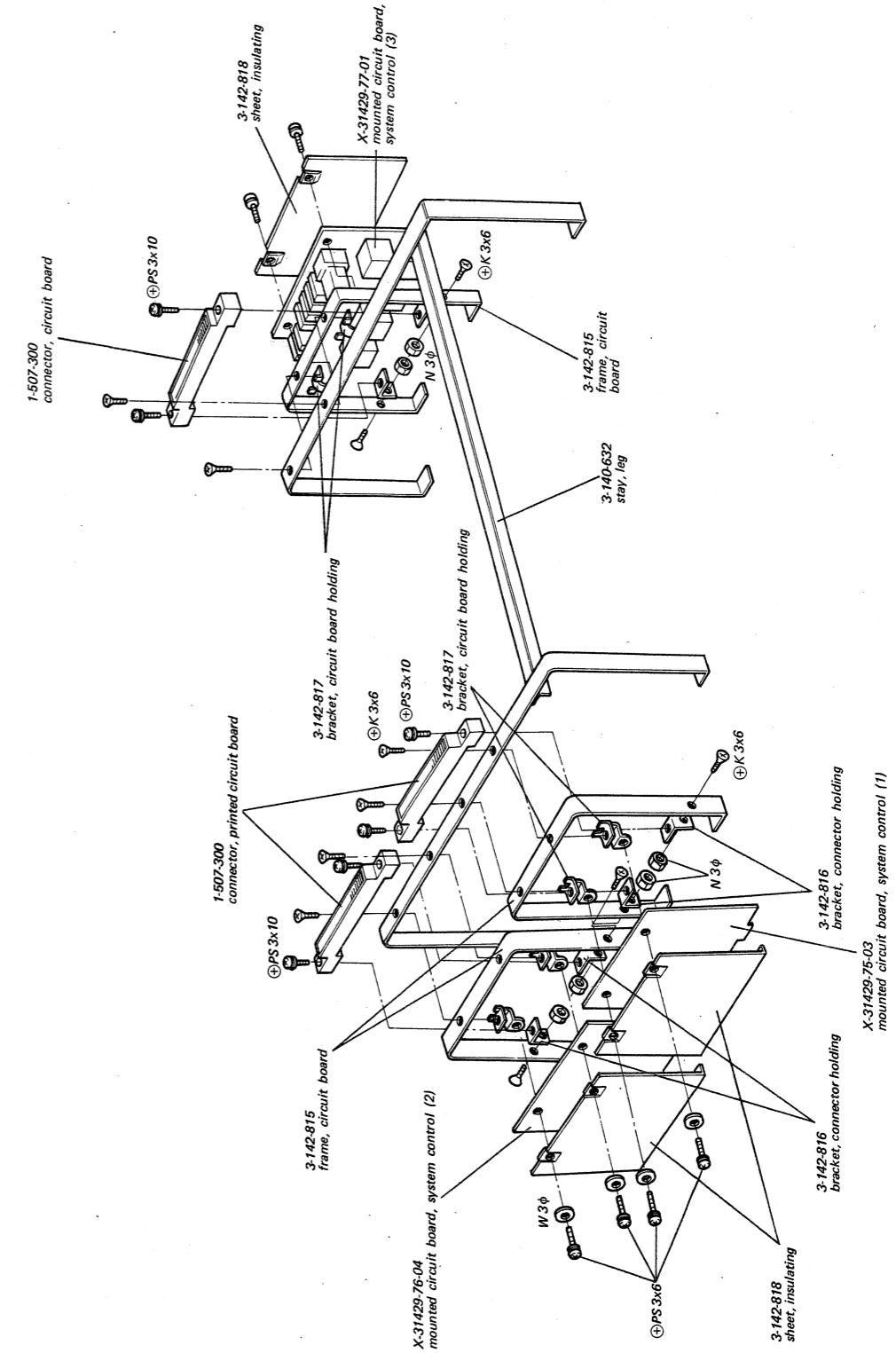
8-7. Amp. Chassis Panel — top view —



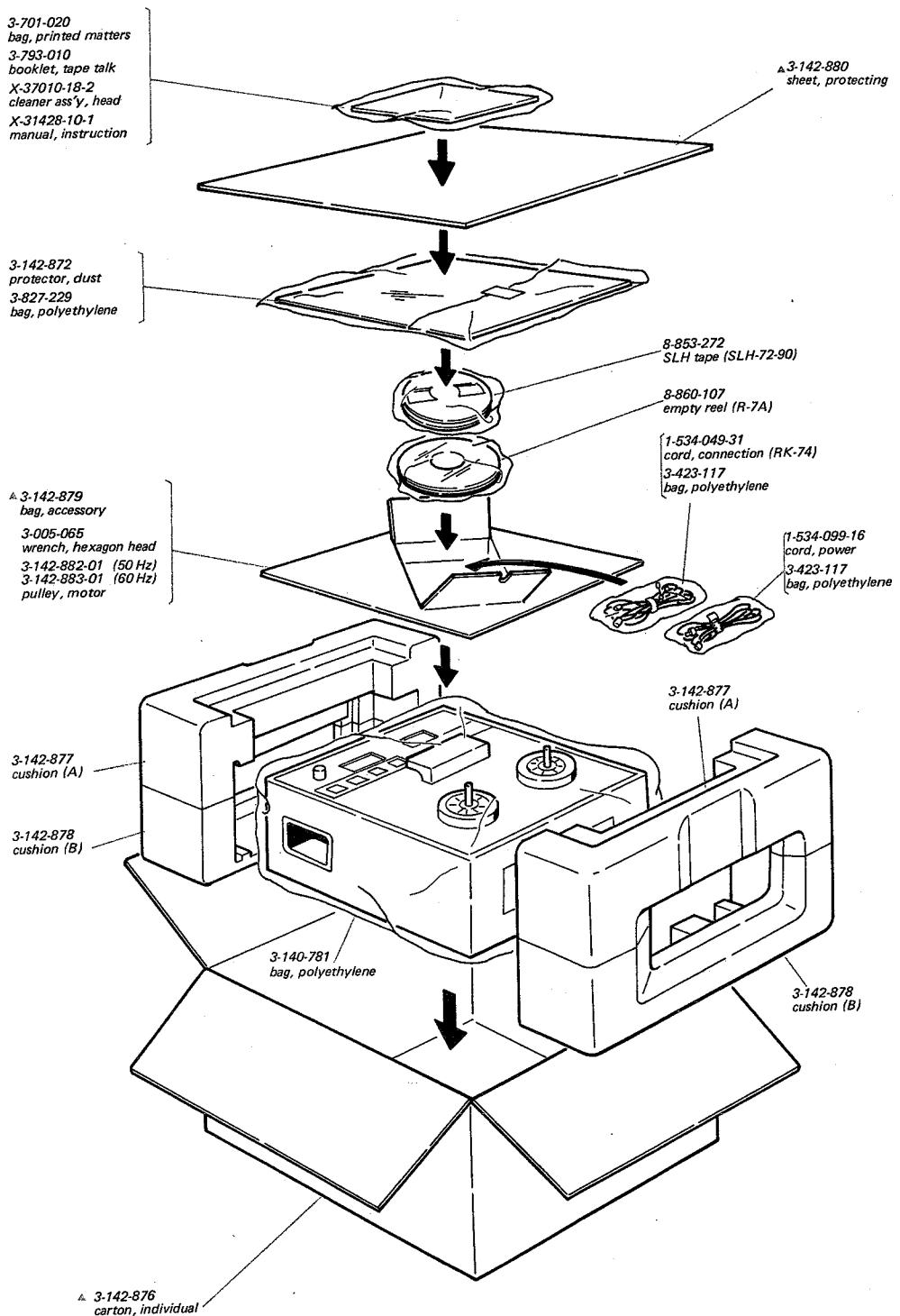
8-8. Flywheel – top view –



8-9. System Control Circuit Boards View



8-10. Packing



Parts marked with △ are included in carton ass'y (X-31428-15).